OLIVIA GIFTY DENNIS

THE IMPACT OF MACROECONOMIC VARIABLES ON THE FINANCIAL PERFORMANCE OF THE COMMERCIAL BANKING SECTOR IN GHANA

Nicosia DECEMBER 2022

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OLIVIA GIFTY DENNIS

Supervisor

Assist Prof. Dr. Turgut Tursoy

Vice Chairmen Banking and Finance Department.

DECEMBER 2022

Approval

After a careful scrutiny of the thesis tittle "THE IMPACT OF MACROECONOMIC VARIABLES ON THE FINANCIAL PERFORMANCE OF THE COMMERCIAL BANKING SECTOR IN GHANA," submitted by OLIVIA GIFTY DENNIS. It has met the unanimous consensus and in our combine opinion, it is fully adequate, in scope and in quality, as a thesis for the degree Master of Social Sciences, and hereby recommended for approval and acceptance.

Examining Committee	Name-Surname	Signature
Head of the Committee:	Assoc. Prof. Dr. Turgut Tursoy	.....
Committee Member*:	Asst. Prof. Mehdi Seraj	.....
Committee Member*:	Asst. Prof. Dr. Ala Fathi Assi	.....
Supervisor:	Asst. Prof. Dr. Turgut Tursoy	.....

Approved by the Head of the Department

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Assoc. Prof. Dr. Turgut Tursoy

Head of Department

Approved by the Institute of Graduate Studies

...../...../20...

Prof. Dr. Kemal Hüsnü Can Başer

Head of the Institute

NEAR EAST UNIVERSITY INSTITUTE OF EDUCATIONAL SCIENCES 1988

Declaration

This research is a tribute to my dear family for their unwavering support of me. You all stood by my side as my rock when the skies were clear, but I was unable to see due to the tears in my eyes. Being an overseas student has been difficult, but you have been an inspiration to me.

Additionally, I would like to dedicate this work to my devoted Uncle, Mr. Augustine Doe Sarplah, whose support and prayers have helped me succeed. I am aware of all the small sacrifices you have made, and I value them.

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Abstract

The objective of this study is to look at the macroeconomic problems influencing Ghana's banks. The World Bank, the Central Bank of Ghana, the Ghana Statistical Service, the Institute of Statistics, and 23 commercial banks in Ghana are used as secondary data sources (2001-2021). The performance of Ghana's banks and the expansion of the economy are predicted using the econometric approaches GMM test result and Pairwise Granger Causality Test. The GMM technique acknowledges the momentary condition, stable in the face of heteroscedasticity and distributional assumptions. Since stationarity could not be obtained at the levels of the variables employed in this study, the application of the unit root findings shows that all of the variables are integrated by order (I), or the initial difference. The significance level was calculated using the 1%, 5%, and 10% levels of significance as measurements. According to the results of the Granger causality test, the consumer price index causes bank assets to return at a high level of 5%, but bank assets do not granger since there is a separate, one-way causal relationship between inflation and an increase in GDP. It is less probable that an increase in inflation will lead to an increase in GDP, but it is more likely to result in inflation at rates higher than 5%. This model distinguished between the four main factors GDP per capita, consumer price index, exchange rate, and inflation that have a significant impact on a bank's financial performance. If the government wants to concentrate on a strong GDP per capita, controlling inflation, the exchange rate, and the high consumer price index is essential. To lower and stabilize microeconomic indicators like inflation and the consumer price index, the Ghanaian government and Central Bank of Ghana should develop and implement sound monetary policies.

Keywords: Gross Domestic Product, Macroeconomic, Financial performance, Ghana

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CHAPTER I

Introduction

Background of the study

One of the key aims of macroeconomic policy to maintain economic stability, and this is true for all nations, whether they are developed or developing. Developing nations are not exempt from this rule. The aims of monetary policy in Ghana are to maintain robust growth rates in terms of gross domestic product (GDP), low inflation, and price stability. The other purpose of fiscal policy in Ghana is to preserve price stability. The nation of Ghana's long-term objective is to have an annual inflation rate that is lower than 10%. Because of the strengthening of the economy, the Monetary Policy Committee (MPC) of the Bank of Ghana lowered the policy rate from 13.5% to 13% on May 15, 2011. It anticipated that this would result in a reduction in the interest rate that charged by commercial banks, which would then lead to a reduction in the overall cost of borrowing money. This result anticipated to occur as a direct result of the reduction in the cost of borrowing money (Jack et al., 2018).

(Jakhu, 2019), used a multi-factor model to evaluate how macroeconomic variables affect stock returns. This study used monthly data from January 2006 to December 2010 to analyze the impact of macroeconomic variables on Malaysian stock returns. Complete data was available referencing how exchange rates affected all banks stock performance and how money supply affected bank stock returns most. In addition, (Abor et al., 2010), studied inflation, GDP, and interest rates are the three most important external influences. To maximize their investments while limiting risk, commercial banks must focus on external factors and improve internal ones. (Jakhu, 2019) also studied the profitability of Indian commercial banks and reported that a bank's liquidity depends on things like how big it is, how much money it makes, how much capital it has, and how much money customers put in. Moreover, (McMackin et al., 2022) studied the U.S. banking industry's profitability from 2000 to 2008 acknowledging how bank-specific and economic factors affected their profitability. They determined that GDP and interest rate changes might explain the bank's earnings. Staikouras and Wood studied European finance from 1994 to 1998 supporting GDP growth had a huge negative influence on ROA, but interest rates had a large positive impact with both factors affected ROA (Mark-Egart, 2020).

(Dasgupta & Mason, 2020) acknowledges that linear regression, GDP negatively affected the return on assets and is important for a company's profit potential. This is the reason why the monetary planning committee at the Bank of Ghana strives to maintain an inflation rate in the single digits. Extensive study has shown that macroeconomic factors like inflation, interest rate, currency rate, and so on are significant contributors to GDP in other developed nations acknowledging the United States and other developed nations. In Ghana, successive administrations have instituted a number of different fiscal and monetary policies in an effort to lower the country's inflation rate and consumer price index hopes of accelerating measured by GDP (Shehaj, 2012). This is despite the fact that these variables might be beneficial research on these factors is dispersed and only available in small amounts. We do not have a clear understanding of the precise relationship that exists between several of these factors, particularly GDP, the policy rate, and inflation. In what measure should the government continue to work toward its goal of achieving inflation in the single digits? Are the level of inflation and the policy rate factors that determine GDP in Ghana? The government of Ghana has to find solutions to these and many other macroeconomic issues before it can move forward.

For the purpose of this research, we will be concentrating on the financial transactions sector (which is a sector within banking) and process of expanding a nation's economy by acting as an intermediary in the financial process. I will be focusing on the role that this sector plays to encourage, the eradication of poverty, and the creation of employment opportunities, it is of the utmost importance that financial institutions be robust (Ochien & Odondo, 2018). Banks in Ghana and the financial services pillars for achieving Vision 2030, which aims to make Ghana a middle-income country by the year 2030? This is because banking and financial services promote macroeconomic stability and long-term growth, with the ultimate goal of transforming Ghana into a nation with a middle class by the year 2030. Because banks play such an important role in an economy, stakeholders pay a lot of attention to the banks' ability to continue operating as going concerns while also preserving their stability (Roa et al., 2022).

As things stand now, the major concentration of attention among academics has been placed on the link that exists between the performance of businesses and the macroeconomic concerns that are relevant to those businesses (Cuesta & Sepulveda, 2018). It is a typical habit to jump to the conclusion that the success of a corporation

can be linked to a select number of important characteristics that are of a macroeconomic nature. Confirmation from financial media demonstrates that investment professionals typically assume that fiscal regulations have unpredictability evidence to support this assumption. Because of this, the factors in macroeconomics have an effect on people's investment decisions, which in turn prompts a significant number of researchers (Grassl et al., 2016).

Since primary marketplace in Ghana is still considered to be restricted and light, the majority of the country's financial industry is focused on banks (Maimbo & Gallegos, 2014). The banks of Ghana exert a strong influence over this industry. Because of this, the manner of financial intermediation in the country relies heavily on banks, particularly commercial banks. According to the findings of (Sharma, 2010), the Ghanaian banking sector serves as a connecting link that brings the nation's economy under one roof. The agricultural and industrial industries, both of which are significant segments, are fundamentally dependent on this sector for their continued existence and development. This industry's performance has greatly improved gradually over the past ten years. During the preceding same period, between 1990 and 2000, 29 banks were placed under CBG statutory supervision (Tran et al., 2021).

This study acknowledges how macroeconomic factors affected Ghana's commercial banking sector during the study period. The daily average exchange rate 1 USD = 10.403712 acknowledgment from the Central Bank of Ghana.

Statement of the Problem

(Sysoyeva et al., 2021), studied numerous economic factors affect the banking industry. He explains how financial transactions affect economic growth. Investors are interested in how macroeconomic issues affect financial institutions' risks and earnings. A bank's specialized services are essential to the global financial system. Unresolved bank issues often lead to a significant crisis and a financial sector that produces a lot of profit is better able to deal with negative crises, resulting in a more robust system. Unsolved government agency problems often lead to bigger issues. (Sysoyeva et al., 2021), banks might fall into a perilous position if they do not create strategic plans in advance and factor in the ongoing condition of the economy while making judgments. Because some cyclical events are severe, macroeconomic factors can be reliable indicators of system stress. Remember this is crucial to

understand the macroeconomic issues that hurt bank performance in the financial sector.

However, several of these researchers have focused primarily on a particular aspect. Despite several studies, the relationship remains unclear. (Devereux & Smith, 2021), investigated whether Kenya's commercial banks' financial performance was correlated with inflation. His research and investigation suggested that banks' performance improved in response to rising inflation. (Samuels, 2005), also studied financial performance and interest rates and acknowledged that increase in interest rates reflected the improved performance. According to the research, the extent to which macroeconomic factors affect commercial banks' financial performance has not been properly investigated. This research is ongoing because banks are influenced by internal and external circumstances. This study aims to determine how macroeconomic factors like inflation, currency, and interest rates have on the commercial banks listed in Ghana.

Purpose of the study

This study purpose acknowledges the impact of macroeconomic variables on the financial performance of the commercial banking sector in Ghana

The following secondary purposes would also be taken into consideration:

- Determining and evaluating some significant macroeconomic factors like inflation, currency, and interest rates affect listed banks in Ghana
- To make recommendations for interventions that might help in reducing any unfavorable effects that the study might find.

Research Questions

- How does inflation affect CBG-listed commercial banks financial performance?
- How does consumer price index affect CBG-listed banks' financial performance?
- How does the currency exchange rate affect CBG-traded commercial banks?
- How does the GDP influence the financial performance of the CBG-listed commercial banks?

Significance of the Study

The result will have greater impact on researchers, Ghanaians and the world at large, for they will know the financial performance of the 32 commercial banks and the macroeconomic variables impacts.

Government Bodies

Other government bodies will acknowledge this research because it will help them understand the positive and negative effects that different economic variables have on the economy, such as whether they slow or speed up and how they can best control each variable to achieve economic growth.

Economists

Economists closely monitor the economy's variables and their impacts. This study will explain how three macroeconomic variables affect a key component of the economy.

Banking Industry

Because the banking business faces internal and external hazards, financial institutions must understand the elements that affect their performance. This research will help them understand how three macroeconomic variables affect bank performance.

Investors/ Business Community

Investors will grasp how macroeconomic forces and other internal factors affect bank performance. This study will help them understand the external dynamics that affect the banking business and when to invest in the area.

Academics and Researchers

This study examines how macroeconomic variables affect financial success. It will also allow participants to examine new macroeconomic variables and find connections. It will also allow students to investigate internal aspects and macroeconomic factors.

Research Objectives and Scope

The purpose unearths financial performance of 32 commercial banks and gives a dynamic nature of the market, which takes into account fluctuating consumer price index and exchange rates, and secondary data spanning the years 2001 through 2021. In this analysis, only CBG-listed commercial banks are taken into consideration. Both Bloomberg Africa and the Central Bank of Ghana are responsible for determining the consumer price index (Morvan & Le Gall-Ely, 2021).

Limitations

This study is constrained in that, despite the large sample size, it mostly covers periods with low predictive potential or that may not be useful due to their lengthy duration. Since research is dependent on facts gathered from prior research as well as a currently conducted study, both are necessary. Ghana, in particular, has not had enough of this study done in the sub-Saharan region of Africa. As a result, there is not enough corresponding study on the subject of the impact of foreign repayments on Ghana's economic progress. A scant amount of evidence suggests that bank asset returns have no discernible impact on economic development. As a result, this study's conclusions could not be applicable to all Ghanaians, which is a severe flaw.

The researcher acknowledges the results of mistakes made in incorrect readings of the questions and challenges utilizing secondary data. Insufficient time and money are, consequently, additional limitations in this investigation.

Definition of Terms

Consumer Price Index

The CPI is a statistic that tracks changes in the cost of particular products and services in urban consumer markets all throughout the country. It keeps an eye on a "basket," which is a group of products and services that are thought to represent what most people buy. Along with pricing information from merchants and service providers, a sample of customers who represent the nation's typical consumer is used to compile these price statistics. The data are combined during the study to track inflation and deflation.

The CPI is seen as a lagging indicator, much like the reporting of unemployment rates. Spending data is not continuously gathered and evaluated instead the

information is gathered first, and then evaluated for additional analysis. Because of this, CPI data more accurately reflects the recent past than it does the status of the economy now.

The delay, though, is frequently only slight. For instance, the May 2022 CPI data was made public in the middle of June. This implies that even though many economists still view the information as current and extremely useful, it is not entirely indicative of actual prices (Shadabfar & Cheng, 2020).

Currency Exchange Rate

The exchange rates can either be predetermined or allowed to float freely. The central banks are in charge of determining the fixed exchange rates, whereas in this study, the US dollar was converted to Ghanaian cedi at a rate of 1 USD = 10.403712 (Devereux & Smith, 2021).

Inflation Rate

Inflation is the rate at which prices for goods and services rise and the value of the currency loses buying power. This investigation used CPI. The CPI measures price fluctuations for consumer goods and services like food, clothing, and cars. CPI measures price changes from the buyer's perspective (Lang, 2021).

Financial Performance

Analyzing a company's decisions and everyday actions in financial terms Tobin's Q ratio measures a company's assets vs. market value. Several business indicators, such as ROI and ROA, show how things went (Pelekh et al., 2020).

Central Bank of Ghana (CBG)

The Central Bank of Ghana makes sure the economy runs smoothly, gives the government advice on money and currency rates, and comes up with and puts into place policies (Samuels, 2005).

Macro-Economic Factors

These elements are significant to a wide economy at the national or regional level and have an impact on a significant portion of the population.

Summary of the Chapter

This chapter gave the background information, problem statement, study purpose, and research questions pertaining to the research issue that being investigated. Additionally, words were explained, and an explanation of the relevance of the study was provided. This study acknowledges how shifts in interest rates, inflation, and currency rates influence the overall financial performance of institutions that are listed with the Central Bank of Ghana (CBG). In chapter 2, we conducted a literature study in order to have a better understanding of the research topics. The study methodology and data analysis were both dissected in Chapter 3. The results and discoveries presented in the fourth chapter. Chapter 5 provides conclusions and recommendations.

CHAPTER II

Literature Review

Introduction

This chapter exhumes economic stability, macroeconomic policy, and this holds true for all countries, developed or developing. All of the questions regarding the study presented in the previous works acknowledged and divided into five parts.

Theoretical Review

The literature review locate the work that other academics and researchers have done on the topic and then analyze that work. In the theoretical review, we will go through previous work in depth. Additionally, it will assist in the interpretation of the research findings. It will also address the shortcomings of previous research. In the following section, we will discuss the economic stability, macroeconomic policy and financial performance.

The Hypothesis of an Efficient Market

(Morvan & Le Gall-Ely, 2021), efficient market hypothesis (EMH) suggests that investors vying to maximize profits would make it difficult to enjoy big profits and divided the EMH into three systems: weak, semi-strong, and powerful. Most empirical research is based on the semi-strong empirical mode hypothesis. According to the EMH, economic players are expected to know all the details about macroeconomic variables that affect stock prices. According to the EMH, macroeconomic changes do affect stock prices. The study aims to determine how macroeconomic variables affect Ghana's stock market.

Modern Portfolio Theory

Modern Portfolio Theory (MPT) tries is carefully picking the fractions of various assets to be held in an investment portfolio by following these four steps to create a portfolio. Allocating assets, valuing security, optimizing the portfolio, and monitoring performance are the processes. The MPT combines a number of assets to lessen the unpredictability of the assortment return. Each asset has a unique return that is not optimum or positive.

(Shadabfar & Cheng, 2020), "Portfolio Selection" introduced portfolio theory, or MPT theory. After 38 years, the study became a relevant theory of portfolio selection

and contributed to financial economics. Before Cheng's research, investors concentrated on asset risks and returns when designing portfolios. Investing advice often includes identifying assets with the biggest profit potential and the least risk, then building a portfolio with them. By following this advice and establishing a complete investing portfolio, aspiring investors can focus on railroad stocks, which have excellent risk-reward ratios. Given this knowledge, one instinctively draws the wrong conclusion. Markowitz formalized it. Instead of creating portfolios from stocks with appealing risk-reward qualities, investors employ mathematics to identify risk-reward-focused ranges. Traditional portfolio construction uses individual securities. Instead of individual securities, innovators should diversify (Shadabfar & Cheng, 2020). According to CAPM, each investor must possess a risk-free market portfolio, whether leveraged or deleveraged. Portfolio theory helps understand methodical risks and potential returns. Because of this, institutional portfolios may be shaped, which encourages passive investing. The portfolio mathematics theory is used to manage financial risks and as a hypothetical starting point for value-at-risk evaluations.

Behavioral Finance Theory

Behavioral finance studies how people's beliefs and actions affect their finances and the market's functioning. It explains and deepens investor trends through logic. This includes emotional changes and how they affect decision-making. Behavioral finance explores human psychology to better understand money and investing. CAPM and comparable models is risk-based asset pricing frameworks (Madanchian et al., 2019).

In this scenario, investors get stock information by word of mouth, ignoring portfolio theory. Investor favoritism might cause an overblown response to some events and an inadequate response to others (Shadabfar & Cheng, 2020). The price reaction during the declaration period was minimal because informed investors overestimated stock values. In the end, the mispricing is confirmed by public information that confirms the event statement. People usually think that big events will start a trend and that stock returns will mirror those during the time when the event was announced.

Determinants of Financial Performance

Internal and external variables affect a bank's performance. Uncontrollable factors affect ultimate output. Characteristics are intrinsic factors. Each bank affects the outcome. Internal management and board choices primarily affect intrinsic aspects. (Madanchian et al., 2019), says that macroeconomic stability, inflation, GDP, interest rates, and political uncertainty are all examples of things that come from the outside.

Gross Domestic Product

GDP is one of the most important gauges of a country's financial health. There are two ways to calculate it: first, by adding up all the money people made during the time; and second, by adding up the goods and services produced by a country over a given year (Nandialath & Rogmans, 2019).

Interest Rates

Interest must always be paid when money is borrowed. The annual percentage rate of interest for the loan is represented by the interest rate. The sum of the interest that is accumulated each day over a predetermined period is the interest rate (typically a year). The variety of interest rates that are made available is a reflection of the borrowers' ability and incentive to meet their obligations. It is also a reflection of the ease with which the borrowers' promissory note, bond, mortgage, debenture, or other loan instrument can be turned into cash, which is a measure of the quality of the money that is being used to pay off the debt.

According to (Laschewski & Nasev, 2021), an interest rate is the expected return on a lender's liquidity. If the interest rate is high, owners of surplus cash will be more willing to invest since they expect higher returns. In equilibrium, investment demand, capital supply, and interest rates are all equal.

Exchange Rates

When currency exchange rates fluctuate, it affects import prices, production costs, and the CPI (CPI). Three networks of imported consumer goods prices transmit exchange rate differences to domestic pricing. Exchange rate fluctuations affect domestic prices. Imported intermediates affect the exchange rate, which affects the cost of domestically manufactured goods. Second, it affects performance. The

final category: domestic things priced in foreign currency. The consumer price index (CPI) is used to figure out how prices have changed based on how much of the import basket is used (Omodero, 2020). Due to shift in equilibrium, domestic prices and nominal wages are under growing demand. As wages rise, domestic prices will also rise. Local industry might be safeguarded by a depreciating exchange rate since the cost of manufacturing locally will increase by considerably less than the depreciation rate, whilst the pricing of comparable imported items will increase by the entire depreciation. Devaluing the currency promotes the growth of domestic enterprises. When the exchange rate rises further, well-managed commercial banks make foreign currency gains. These profits improve banks' income statements (Omodero, 2020).

Inflation Rates

Investors want a premium price during market uncertainty to protect themselves from inflation. This reduces investors' ability to invest. Investment must be encouraged to stabilize inflation (Omodero, 2020). According to (Nandialath & Rogmans, 2019), macroeconomic policy failures cause FDI to leave Africa. Negligent fiscal and monetary guidelines have caused insurmountable budget deficits and inflationary pressures, which have contributed to rising local production prices and an unstable exchange rate, making the region a risky environment for investment.

The Influence of the Rate of Inflation on the Profitability of Financial Institutions

Inflation has affected bank's financial performance and rise in a nation's general price level (Tarawalie & Kargbo, 2020). According to (Tarawalie & Kargbo, 2020), inflation is a macroeconomic indicator that affects bank loan interest rates. This puts upward pressure on prices when more money is available than is needed to boost output. Too much money is spent on too few products.

Factors that Cause Inflation

Inflation reduces a country's currency's real worth, so one unit can buy fewer goods. Inflation reduces households' buying power. An overabundance of currency happens when a government prints too much money compared to the available goods

(Anderl & Caporale, 2022). Oversupply of currency is one element that causes inflation. Due to too much money competing for too few commodities, prices rise. Hyperinflation is caused by a growth in money supply relative to demand. In an economy when the central bank finances the government's debt due to severe deficits, this occurs during a budget crisis. One of two things has usually caused these inadequacies. Deficits are often created quickly because of wartime reconstruction. Initial funding may need to be borrowed. The government may have problems repaying loans or rolling over debt if economic growth is poor. If merchants lose faith in the country's currency and hike prices, the problem could worsen (Anderl & Caporale, 2022). Germany, Austria, Hungary, and Poland had hyperinflation after World War I. During Germany's 1923 inflation crisis, prices doubled every other day. (Tarawalie & Kargbo, 2020), examines Germany's hyperinflation during this time. A sudden surge in tax revenue may have strained the economy, reducing the amount of money available to build infrastructure in rapidly rising economies. (Anderl & Caporale, 2022), discusses elements that contributed to Argentina, Brazil, Nicaragua, and Peru's problems in the 1970s and 1980s. In the 1960s, when developing economies borrowed significantly, especially from overseas investors, to create infrastructure, hyperinflation was sown. This led to hyperinflation (Tarawalie & Kargbo, 2020).

Short-term economic shocks can cause inflation (an in-depth examination of German hyperinflation during this period) A critical item's price may rise quickly and dramatically compared to other goods. Because the market does not have time to lower other prices, the entire price temporarily raises (Anderl & Caporale, 2022). Inflation is a major element in bank efficacy. (Roa et al., 2022), studied inflation's impact on bank productivity. Whether bank labor costs climbed faster than inflation affects bank productivity. The strength of the macroeconomic environment influences whether reliable inflation forecasting is achievable.

Inflation is used to measure the macroeconomic influence on financial institutions' productive capacity. (Roa et al., 2022) observe that inflation's impact depends on whether banks' wages and other costs rise faster than inflation. Despite inflation being anticipated or not, the relationship between inflation and gainfulness is uncertain. A bank that can effectively estimate inflation may be able to modify financing costs to grow income faster than expenses and gain significant advantages. Unanticipated inflation may lead to ill-advised modifications in loan terms;

increasing the chance, that spending may expand faster than incomes. (Omodero, 2020) found inflation boosts bank performance. Most research concludes that inflation improves financial institutions' performance. The current study examines development and unified organizations in a developing economy.

Effect of Inflation on the Economy

When inflation rates are excessively high for a long time, economic growth and pay inequality suffer. (Roa et al., 2022) analyzed 1980-2010 data from 84 nations to determine inflation's impact on financial development. Standard and fixed-effects quintile regression were employed empirically. The research suggests that price increases have a negative, nonlinear effect on financial variables. This affected poor countries more than wealthier countries.

ROA and ROE were examined (ROE). Inflation stunted Brazil's financial progress during that time, the study found. (Omodero, 2020), evaluated the effects of high inflation on capital stocks. The findings demonstrated that financial technology makes it easier to transform assets into debt collateral. Quantitative research demonstrates that macro prudential regulation depends on government knowledge, lending limitations, and innovative financial products.

(Tarawalie & Kargbo, 2020), showed how monetary policy affects Kenya's loan availability. This study was descriptive. A regression analysis determined how monetary policy affects loan availability. Each variable was analyzed using secondary data. The CBR, CRR, OMO, and inflation were used to determine monetary policy. Credit supply was measured through commercial bank loans. Quarterly data collection lasted 11 years (2005 to 2015).

Data was analyzed using E-views and Excel (version 2003). The study found that CRR, OMO, and inflation all reduce credit supply. The model also explains the long-term link between credit supply and OMO, CRR, CBR, and inflation. The model was fit to the data. Macroeconomic adjustment takes so long in Kenya because the wealthiest have traditionally benefited from rising inflation.

Factors affecting Banks Performance

(Dasgupta & Mason, 2020), studied the financial performance of Nairobi Securities Exchange companies in Kenya. Trade-off and agency theories influenced it. The study used an explanatory research approach and focused on 29 Nairobi-listed

companies from 2006-2012 examined variable leverage hurts financial performance, according to the study. (Dasgupta & Mason, 2020), found that liquidity improves financial performance. The company's size and longevity boosted its financial performance. According to research, advantage, liquidity, firm size, and age all improve a company's financial performance.

(Anderl & Caporale, 2022), researched how financial leverage affected Nairobi Securities Exchange non-financial enterprises. This investigation was quantitative. The study's population includes 48 NSE non-financial enterprises. The study used secondary data from 2011 and 2015 audited financial accounts. These datasets were analyzed using correlation and multiple linear regressions. According to the report, financial leverage hurts financial performance. The study found a favorable correlation between company size, liquidity, and financial performance. According to the report, non-financial enterprises listed by the Central Bank of Liberia (CBL) should have a limited debt level or an optimal debt level and focus on hiring strong management (Kipngetich et al., 2021).

(Laub, 1999b) investigated the elements that determined the Romanian insurance market's financial success from 2008-2012. (Javaira & Hassan, 2015), created a model to anticipate financial trouble among publicly-traded companies in Kenya, where the wealthy have gained from excessive inflation. Brazilian publicly traded corporations tested the model. (Nazir et al., 2021), said that a country needs to keep inflation low and under control if it wants its financial industry to be strong and busy.

Effect of Inflation on Banks Performance

(Nazir et al., 2021), analyzed Chinese bank profitability. It was studied using bank-and industry-specific factors. The study sampled 101 banks. Non-traditional activity and increased taxes explain low profitability, say the authors. The authors also proved Chinese banking competition. (Javaira & Hassan, 2015), examined the impact of inflation on Kenyan banks' profitability. Data was collected from Kenyan commercial banks. Return on Assets (ROA) was used to measure profitability (ROA). Leverage, liquidity, inflation, and firm size explain 36.8% of commercial bank ROA fluctuations in Kenya. High inflation rates hurt banks' profitability and some recorded record losses, as reflected by ROA values (Javaira & Hassan, 2015), studied inflation's impact on Kenyan company yields. The 1998-2013 study used the

GARCH model to show the influence of inflation on firm yields. Inflation has a negative effect on profitability, and stock returns are poor when inflation is strong because investments are transferred from the stock exchange into non-inflationary corporate operations. The study found no apparent effect of inflation on stock market returns and volatility, which affect corporate profitability ((Iqbal et al., 2020).

The Impact of Interest Rates on the Performance of Banks

They help produce capital and affect investment decisions, job creation, monetary policy, and corporate profitability. Interest rates reflect market understanding of predicted changes in buying power or inflation (Saddam, 2020). (Laub, 1999) say that interest rates are based on direct taxes, reserve requirements, transaction costs, and forced investments.

The cost of borrowing money is the interest rate (Saddam, 2020). Declining interest rates sometimes lead to slower investment revenue growth, hurting bank performance. The cost of borrowing is another (non-bank) drawback of interest rate changes. (Saddam, 2020), says banks may also gain from higher interest rates because much of their profit comes from the float, the time between clients' savings and withdrawals. Banks invest clients' savings then by rising interest rates boost bond returns.

Bank Performance and Interest Rates

Poor commercial bank performance is typically linked to interest rate instability. The direction of the relationship is hard to prove, but research shows that unstable interest rates affect how well banks do financially(Taylor, 1989). In Thika, Kenya, SMEs' financial performance was not affected by capital structure, asset turnover, or asset tangibility. A continuous reduction in market interest rates makes it harder for banks to offer high interest rates to consumers and maintain profitability. This was tested in Taiwan as bank interest rates fell. (Jiang et al., 2018), looked into the relationship between market interest rates and domestic bank profits by using (Jiang et al., 2018), model.

Increases in interest rates may not affect interest rates since future cash flows are discounted at greater rates. (Jiang et al., 2018), argue that interest rates affect banks even if their assets and liabilities are well balanced. From 1981-1999, the DAX and money market yields had a negative relationship. High interest rates also hurt the

performance of German government bonds (REX), which is positively connected with the DAX. He conducts a regression of company stock returns on the REX index return during 1990-2001 to discover interest rate fluctuations. His findings demonstrate that a spike in REX index returns is a good indicator. Fixed income returns boost stock values. Rising interest rates hurt the German banking sector's market value (Jiang et al., 2018). The approach yields similar findings for banks and P&C insurers. Banks' interest rate exposure is small yet powerful, whereas P&C companies are more immune due to annual policy renewal and modifications. A series of studies employing ROA and ROE as dependent variables to analyze bank profitability found a link to the macro economy (Author & Ullah, 2020). Some argue that a more mature environment predicts more competitive profit margins, which reduces GDP in industrialized countries (Ngweshemi & Isiksal, 2021).

(Tiep et al., 2020) studied the influence of market interest rates on Pakistani banks' profitability. The sample was divided into two categories to better understand the impacts: The survey comprises four nationalized and six private-sector banks. The regression model was used to see how interest rates affected profitability. Private banks' ROA and ROE are more affected by interest rates than public banks'.

In a related study, (N. Khan & Malik, 2020), incorporated interest rate as an independent component 2006-2010. In the end, interest spreads are linked to bank profitability, but in the short run, they are insignificant.

(Qiu et al., 2020), studied Ghanaian bank interest rates and profitability. The study analyzed 28 banks using least-squared regression. This means the bank will strive to boost net interest margin by increasing interest income and reducing interest expense. Increased ROA will push banks to raise interest margins to offset rising operational costs.

Effect of Interest Rate on Investment Decision

Borrowers are interest sensitive, so a unit change in business bank interest rates would affect potential investors more than proportionally (Ludl & Michoel, 2021),. (Ludl & Michoel, 2021), say that when the interest rate on loans drops by 1%, 12% of investors think about buying loans from banks. Interest rates change based on risk, assessment, development, money-linked market faults, and taxability. Borrowers' reactions to interest rate charges indicate the division's weakness. Borrowers are seen as impartial or risk-averse. They speculate on bank interest rates.

Interest rate predictability determines a capital venture's risk (Crits-Christoph et al., 2020).

Higher interest rate spreads pose a risk for investors because the venture's advent cannot be accurately predicted (Ludl & Michoel, 2021). The development time of a budgeting device is significant. Development has a key role in determining the business bank interest rate by determining the loan length, which depends on interest rate volatility (Crits-Christoph et al., 2020).

The Consumer Price Index

People have been hearing more and more about the Consumer Price Index (CPI) in the news as 2022 approaches and inflation in the United States reaches 40-year highs. In addition, while most of us are aware that the CPI is a measure of economic activity, not everyone is aware of scope or personal finances. Learning the fundamentals of the Consumer Price Index is beneficial for keeping up with current affairs and improving your general financial and economic knowledge. In light of this, let us examine what the CPI is, how it operates, what it monitors, and how it could affect your budgeting plan.

The CPI is a statistic that tracks changes in the cost of particular products and services in urban consumer markets all throughout the country. It keeps an eye on a "basket," which is a group of products and services that are thought to represent what most people buy.

Along with pricing information from merchants and service providers, a sample of customers who represent the nation's typical consumer is used to compile these price statistics. The data are combined during the study to track inflation and deflation. The CPI is seen as a lagging indicator, much like the reporting of unemployment rates. Spending data is not continuously gathered and evaluated. Instead, the information is gathered first, and then evaluated for additional analysis. Because of this, CPI data more accurately reflects the recent past than it does the status of the economy now.

The delay, though, is frequently only slight. For instance, the May 2022 CPI data was made public in the middle of June. This implies that even though many economists still view the information as current and extremely useful, it is not entirely indicative of actual prices.

How the Consumer Price Index be calculated and how it operates

The CPI gathers information on consumer spending from a small sample of people who are thought to be representative of the general population as well as from retail prices for goods and services. This is different from the Producer Price Index (PPI), which tracks changes in prices for providers of products and services. This implies that the CPI reflects the cost of the goods and services in question to consumers. When the statistics are reviewed, all expenses, including user fees, excise taxes, and sales taxes, are taken into account. As a result, the data more accurately reflects what customers actually spend at the register or what actually leaves their bank accounts when they make a purchase. Those costs can have a significant influence on household budgets, particularly when accounting for inflation.

The Measures Used by the Consumer Price Index

As was already established, the CPI measures information gathered from customers, the basket's contents are modified over time to reflect precisely what customers are buying. A category is more likely to be included in the basket if it receives a lot of activity. A category could be dropped from the basket if spending in it slows down. For instance, housing is frequently included in the basket because it is a significant area of expenditure for almost all households. Changes in purchase patterns are seen for groceries. Cereal may be quite popular one month, but that may not be the case the following. The selection of the basket's contents is intended to be unbiased, with metrics used to decide which products and services are included. Additionally, it's a bit broad. For instance, the CPI frequently classifies all cereals as one category, which causes a range of brands and products to be included. Other criteria are also included in certain CPI assessments. For instance, in addition to broad reports, more detailed ones can show the spending habits of particular demographic groups or geographical regions.

What purposes does the consumer price index serve?

The CPI is a general economic statistic that tracks both inflation and deflation. It enables government agencies to evaluate the efficiency of different strategies intended to stop severe inflation or deflation. It also illustrates how future pricing changes can affect household spending and budgets and monetary policy frequently considers the CPI. For instance, the Federal Reserve uses information

from the CPI when making decisions regarding interest rates to make sure inflation and deflation are properly taken into account. Agencies can evaluate changes to the buying power of a dollar using the CPI. They can see how far a dollar may go in terms of consumer spending thanks to it. They can use this information to determine if prices for products and services are rising in line with salaries or how the American economy is doing in comparison to other nations' economies. The CPI occasionally modifies some income payouts. For instance, if the CPI indicates that the cost of goods and services is growing, Social Security benefits may increase. Additionally, it will result in compensation adjustments for those who qualify for cost-of-living raises, such as government employees and members of the armed forces. The federal income tax regime may change as a result of the CPI. This is intended to prevent tax rate increases caused by inflation. The reports occasionally also change who is eligible for certain programs, including SNAP, free meals at schools, and others. Some contend that the CPI can overestimate or understate inflation and deflation, despite the fact that it is frequently hailed as an objective statistic. This is typically due to disagreement about the most accurate method of determining inflation and deflation. The CPI was originally intended to be a cost of goods index (COGI). However, following changes, it evolved into a cost of living index (COLI). The change was intended to get rid of biases that might provide misleading reflections of inflation and deflation, according to the Bureau of Labor Statistics. Some people believe that the adjustments enable the CPI to publish lower inflation statistics. Because of this, some economists consider it data manipulation, whereas others do not. Additionally, not all pricing changes are taken into account when using a basket. While handling and evaluating so much data would be challenging, to say the least, it may result in the omission of a potentially important component. In the end, even if the CPI may not provide a precise representation of consumer economic situations, it nonetheless enables individuals to follow broad price changes. Therefore, even if it has a little defect, the consumer price index is still a useful tool.

Effects of Exchange Rate on the Financial Performance of Banks

Currency swings impact import values, producer prices, and CPI. Three methods transfer exchange rate changes to household costs. First, the exchange rate influences the cost of imported secondhand things (Plane, 2021). Second, import

costs, exchange, and transportation for middle-of-the-road items. Rate changes affect local delivery costs third, local goods are priced in foreign currency. The quantity of imported items in the usage basket determines how much the shifts are reflected in the purchaser value record (CPI). If devaluation raises import prices, demand for competitive domestic goods will rise. As requests mounted, household costs and apparent salaries gained importance. Wage hikes will raise local costs. Previous analyses focused on foreign or multinational firms' hazards. Using a broad sample of enterprises from a range of nations, (Newswire, 2018) identified a link between distant exchange presentation and outside mobility. Larger organizations had a better remote exchange presentation after controlling for outside activity. This happened despite limiting outside activity. (Plane, 2021) used the auto sector in the US and Japan to show that currency rates are presented at different periods in different countries, even if outside deals constitute a big part of the presentation.

Factors Affecting Exchange Rate

Previous research has examined factors; including (M. I. Khan et al., 2021), researched Pakistan's exchange rate's macroeconomic aspects. A macroeconomic study looked at exports, imports, interest rates, inflation, and current account balances. From 1991 to 2014, yearly data was collected. The data's stationary was determined using an upgraded Dickey-Fuller test. Three co-integrated equations were found because their probabilities were over the threshold. Both the 5% and 1% significance levels were agreed upon.

(Morema & Bonga-Bonga, 2018), studied how globalization affected the currency rate. The research suggests reducing imports and increasing FDI to boost the currency rate. (Akkas, 2020), studied how exports, interest rates, and inflation affect ASEAN currency exchange rates. (Akkas, 2020) also studied Pakistan's currency rate and some of the most important factors affecting currency exchange rates. Inflation, growth, and imports and exports affect exchange rate variations. The study also demonstrates that economic progress generates the second most exchange rate fluctuations, with exports and imports ranking third and fourth.

Exchange Rate Risk and Bank Performance

ER devaluations are beneficial for Colombian businesses and banks, whereas ER appreciations are detrimental. Because of these results and the fact that the

central bank prefers to let the currency rate float more freely when it is expected to go down, companies no longer need to use financial derivatives to protect themselves from exchange rate volatility (Kipngetich et al., 2021).

Depending on how much of an economy's consumption is made up of imported items; exchange rate swings may affect prices (import penetration ratio). According to macroeconomic theory, open economies act as international price takers. The government will push exports in every aspect of commerce, at any cost (Cubillos-Rocha et al., 2021). The government will cut the exchange rate to achieve this.

(Adhiambo, 2022), studied the consequences of shifting currency rates on financial institutions. This descriptive analysis focused on 43 Kenyan banks. The study found a weakly positive link between exchange rate changes and commercial bank performance. During the study period, the KES's excessive volatility against the USD hurt bank performance. Volatility hurts bank performance. The stock market also suffered. According to the statistics, the Kenyan shilling (KES) depreciated against the U.S. dollar during the research period.

Using market capitalization to measure long-term corporate success assumes market efficacy, which might be problematic. The evaluations expect diverse economic sectors to reflect new money supply facts. This presumption may not be proven in all commercial domains and settings, especially in times of crisis and in less fluid markets like those in developing nations. Companies that think they will make more money from a long-term drop in the value of their currency will probably buy more machinery and plants to increase their profits (Cubillos-Rocha et al., 2021).

(Adhiambo, 2022), reference that study's design was better adapted to its goal of profiling the effects of exchange rate changes on Ghana commercial banks' financial performance. This analysis targeted Kenya's 43 commercial banks as of December 2014. According to the study, there is a correlation between changes in foreign currency values and banks' return on assets ratios.

(Alper et al., 2020), found that volatility and returns have a weak relationship. The correlation analysis found that a change in local currency value affected bank performance. Correlation revealed one Kenyan shilling was worth a lot more than one U.S. dollar. (Cubillos-Rocha et al., 2021), extends these ideas into a few basic models, and various studies have found advertising's value in a range of businesses. (Cubillos-Rocha et al., 2021), provide a great examination of experimental writing

on this topic. For goods shipped to the U.S., the average value reaction is about one, which is a big part of the change in the exchange rate (Nganga & Atheru, 2020).

Monetary Theory

The Quantity Theory of Money

Friedman acknowledged that "Let's say a helicopter hovers over this village and drops $1,000 in cash nothing would happen if everyone kept his or her excess income. Prices and nominal income would stay the same, at $10,000 per year. 10.4 weeks of income would be the community's cash balance, not 5.2 not how people act and nothing has made cash more appealing than previously. Assuming he was in stable equilibrium earlier, he will seek to increase his spending and lower his cash holdings. In addition, he will spend more than he earns and another man's expense is his gain. The community cannot spend more than it receives. People will not be able to spend more than they earn, but their income will raise the nominal value of services (Burns, 2011).

In contrast, (Portnoi, 2019), acknowledged that: "Suppose that doubling money and circulation does not immediately raise prices but instead reduces velocities by half." Unchanged pricing has caused an agent's deposits to treble. He will buy products with his extra cash and deposits. As long as someone else takes the money, its transfer will not reduce its quantity in the community. Someone else's excess will rise. Everyone has more money than experience and convenience require. Everyone wants to spend this additional money and no one can disagree that spending more money would raise prices (M. Jensen & Meckling, 2012).

Friedman and Schwartz acknowledged Fisher's quantity theory in other publications. They value Fisher's previous efforts to rebuild currency and deposits. In addition, Friedman and Schwartz acknowledged Irving Fisher estimated public currency and deposits for 1896-1901.

Gibson’s Paradox

(Assa, 2022), resolved the paradox with interest rate adjustments. Genuine forces like technology and business expectations may explain long-term changes in the real yield on capital. If the business cycle expands, the natural (real) interest rate will rise, increasing the demand for loanable funds. Financial firms raised the quantity of cash they lent and generated while decreasing their reserve ratios. As

their reserve ratios fell, they raised lending interest rates. With rising costs, interest rates should climb.

Fisher estimated short-term and long-term securities using yearly British and US data from 1815-1914. Fisher tied interest rates to his price forecast. He extended the delays until R2 reached its maximum, and then determined the link was substantial. The 10-year mean lag had the greatest R2 value, according to his analysis. Friedman, (Cornish, 2020), contain more objections to Fisher's approach and the subsequent research. The facts corroborate Fisher's theory regarding pre-WWI. However, delays were shorter between conflicts, and there was no relationship after World War III. Fisher was an early, expert user of reasonable expectations. His empirical study showed a reduced impact with this approach. We have reached the same conclusion after further experience.

Money and Business Cycles

Their field considers Irving Fisher a pioneer. Monetary policy and business cycles have become controversial in recent decades. Before the Great Depression, business cycles were considered monetary. Irving Fisher titled a famous article "A Dance of the Dollar," and this was the popular belief at the time. (Portnoi, 2019) Fisher, I. (1911) says "the businessman's profit will expand" since his interest rate will not change soon. Since the rate was adjusted so slowly, the real rate is now lower. This leads to bank borrowing and deposit growth, both of which contribute to price inflation. These impacts reduce prices and boost transaction volume temporarily (Aspromourgos, 2019). When nominal interest rate rise matches inflation rate, growth ends. As banks' reserves diminish, nominal rates raise (Portnoi, 2019).

The Phillips Curve

Friedman disputed the Keynesian premise of a permanent tradeoff between inflation and unemployment. According to these findings, authorities may choose between reduced unemployment and higher inflation. Friedman established in a 1968 AEA speech that the Phillips curve's tradeoff is temporary because workers lag behind inflation. Friedman's argument Long-term, the Phillips curve is vertical. Policymakers can only reduce unemployment by speeding up inflation. Friedman, M. (1974) recognized its importance in an IEA article and says the Phillips curve discussion began in 1926. "Phillips approached the problem differently than Fisher."

He said that employment was the independent variable that started the process. His analysis focused on salary increases. His logic was basic-I hate to say simple-in terms of static demand and supply.

Bimetallism

Fisher was at the height of his academic career during the late-nineteenth-century gold standard vs. bimetallism debate. His early studies focused on bimetallism (Portnoi, 2019). According to him, the bimetallic ratio determined whether bimetallism boosted stability. Clark said the deflation after 1879 was predictable and constant. Due to the expected drop in inflation, contractual rates were lowered. It would be unethical to reward debtors by increasing market inflation. Fisher developed the notion of real and nominal interest rates. He also obtained his theory's business cycle conclusions. He constructed a large data bank, including numerous nations, to determine whether long-term price variations were incorporated in nominal rates. Fisher lacked the newest statistical approaches for analyzing panel data despite limited instrumentation; he was able to derive substantial inferences from his data. Fisher concluded that the 16-to-1 bimetallism was a bad design, despite being successful. Fisher noted that most loans were short-term. Many agricultural mortgages had five-year durations. Most of the debts accrued during the deflation after 1879 had been cleared, so there was little that could be done to compensate for unanticipated contract losses. The 16-to-1 inflation expected from bimetallism would over compensate borrowers for the deflation caused by their prolonged debts, "defrauding the lender" (M. P. Jensen et al., 1990). His thesis includes worldwide implications due to his recent interest rate studies. Bimetallism, which was introduced at the market ratio, may be an alternative worth considering. The globe is being offered 15-1 or 16-1 odds on bimetallism. Any nation that implements bimetallism would lower global standards. In gold-standard nations, this means debasement, whereas in silver-standard nations, we witness a drastic currency contraction and appreciation. The legal ratio cannot affect the market any other way. Losses for creditors in the former nations and debtors in the latter countries would be far bigger than those we have seen from the steady and only partially predicted appreciation of the currency over the previous 20 years (Fisher, 1895). Friedman and Schwartz did not recognize Fisher's analysis since A Monetary History did not address bimetallism. Bimetallism is introduced as a political movement that limited

silver commercialization and threatened the gold standard. Friedman commended Fisher's revolutionary bimetallism work and validated Fisher's earlier conclusions. Bimetallism's monetary system has numerous benefits over pure silver or gold. Bimetallism would have been terrible in 1896, when the ratio of silver to gold was 16 to 1.

The Compensated Dollar

In the Philippines, silver coins were used for daily transactions, but they could be exchanged for gold notes at a set rate. The Philippines paid these payments using a New York gold reserve. Due to a BOP imbalance, gold would be lost. Fisher's process may strengthen Human adjustment. Under Fisher's concept, exports of a country hit by a price shock would decline much faster than under the traditional gold standard. The compensated dollar scheme no longer fixes exchange rates, according to Fisher's critics. Critics noted this. Stable exchange rates were another virtue of the conventional gold standard. Fisher later recognized these critiques and advocated that all governments adopt the compensated dollar model to maintain exchange rate stability. In this case, monetary base adjustments would be key. These developments reflect gold mining and artistic and industrial gold use. Fisher's idea supports the usual method and under the original gold standard, a rise in the general price level would reduce the real price of gold and the mining incentive. Fisher has compensated dollar, nominal gold prices would decline, resulting in a lower actual price. Fisher suggested changing the money supply automatically to keep prices steady under the compensated dollar scheme. As previously imagined, the monetary basis is just yellowbacks, each of which entitles the bearer to a set amount of gold in reserve.

When citizens deposit additional gold into the reserve, the government issues new yellowbacks and when people cashed in their yellowbacks for gold, the authorities destroyed them. Due to changes in gold's value, the total amount of yellowbacks in circulation may exceed or fall below the gold reserve. Say the government chose to keep the gold reserve equal to the quantity of money in circulation. When the gold reserve exceeds the amount of money in circulation, the government either cancels or prints new yellowbacks. In either situation, the gold reserve would equal circulation. The government would follow this equation concerning symbol upkeep. Fisher advocated for a simple monetary feedback

approach based on this link and his rule for modifying prices while sustaining R. 3) What does "Mb*t+1 = -P t" mean? As long as the aggregate price level remains above the objective, the monetary base will decline. According to quantity theory, stabilizing the dollar muddied the meaning of the compensated dollar. Fisher says the quantity theory was received with opposition. Many who disagreed with the quantity theory believed in commodity theories. Fisher wanted to convince believers in commodity price level theories to support his scheme. Fisher wanted his proposition to succeed.

A Price Stability Mandate for the Federal Reserve

He stated that the Federal Reserve could accomplish this. Fisher's primary worry was that the understanding and leadership of a single individual was necessary for the stability that was seen in the 1920s. Fisher hoped to formalize a rule that would maintain price stability. Later on, he sent an amazing letter to Clark Warburton in which he described everything, and Thomas Cargill came across the letter (1992). Fisher provided the following explanation for his support of a statutory need for price stability.

Stamped Money

Fisher was confident that open market growth might raise money. During the worst of the economic slump, he worried that a growth in bank reserves might not be lent out and that money might be hoarded. Stamp scrip differs from ordinary cash since it requires periodic tax payments. Unpaid taxes reduce the value of scrip as cash, making it less valuable. A $1.00 bill's value would drop to $.95 on a fixed date after issuance unless a $.05 stamp was acquired. Unless cancelled. At the post office, a stamp indicates that the tax has been paid. The goal was to encourage people to spend rather than preserve money and stimulate economic activity. Fisher argued for stamped money because of current circumstances. Hundreds of towns in the U.S. and throughout the world issued scrip to reduce budget deficits and help areas devastated by bank failures. This was done to replace lost income. Scrip is valid without being stamped. Local governments often issue IOUs. It was released at a suitable denomination, so residents might use it as money. Several localities tried adopting stamped money, following the principles of German trader and economist Silvio Gesell, whose publications guided the stamped scrip movement. Gesell affected

these cultures. Fisher, with his usual enthusiasm and fervor, jumped deeply into the effort, establishing a clearinghouse for information about stamped money and advising municipalities on how to issue it. Despite this, 1930s Chicago economists did not like stamped money. Fisher and Chicago economists agreed on a distinct "crazy idea" during the Great Depression.

100% Reserves

100% of the money and other improvements Fisher advocated for are simple ideas. Instead of fractional reserves, banks must keep 100% of deposits. Banks would store money and they would have to charge for maintaining and transporting cash. If the government continued to pay interest on Federal Reserve reserves, financial institutions would have another revenue source. 100% of the country's reserves would prevent a money supply collapse similar to the one that occurred in 1929-1933. Fisher believed price level stability and, by extension, real economic stability could be achieved by combining one of his monetary base plans with 100% reserves. Fisher pushed for a fundamental transformation that he regarded as a natural continuation of previous events. (Pires & Branco, 2010), a period economist, believed that banks' enormous excess reserves were inflationary weapons that might be countered by boosting reserve ratios. He also said it was common for tax depositors, especially smaller ones, to deposit, withdraw, and transfer money. It felt proper to use all available funds for complete reserves.

Fisher's attempt to promote the subject makes this understandable. Friedman said the only alteration he made to the Chicago proposal, popularly known as "100% reserves," was to have the Fed pay interest on reserves. This was his only change to the plan and adjustment was implemented after 2008's financial crisis.

Empirical Review

(Alzubaidi & Al-Shamery, 2020), studied short-and long-term links between macroeconomic variables. Long-term and persistent increases in local stock prices raise the local currency's value due to demand. He conducted this again using (Huang & Zhang, 2020), counteraction analysis and monthly time series data starting in January 1987. Macroeconomic indicators were made based on research on the general stock prices on the Jordanian capital market (Al-Matari, 2021).

(Farah, 2020), studied GDP per capita, as part of their comprehensive study of variables that are not governed by bank administration regulation but can influence bank performance. A seven-year study of 80 nations ending in 1995 indicated a positive relationship between inflation and profitability. Profitability is correlated with GDP per capita. Combining organizational and influence aspects made banks more profitable in developing and industrializing countries.

(“The Impact of Capital Structure on Profitability of Banks in Malawi,” 2020), studied short-term and long-term modifications that modify equilibrium connections. Scale economies and financial success caused these developments (1990-1999).

(Al-Wesabi & Yusof, 2020), tried to investigate whether banks' earnings are connected to occupational rotation. Despite not directly controlling the business cycle, the variables considered in the study revealed a link. Mutwiri et al. (2021) employed a restricted number of macroeconomic variables, which was insufficient. (Al-Wesabi & Yusof, 2020), found a connection between GDP growth and GNP per capita. (Saif-Alyousfi & Saha, 2021), used GDP, unemployment, and interest rates.

(Bukair, 2019), studied the areas during 1989-2002 and the results demonstrated a relationship between factors and managerial decisions. These choices affected Greek commercial banks' ability to make money. (Mutairi & Naser, 2015), studies the influence of bank features on bank structure over 17 years (1983-2000). Extraordinary net interest margins and banks' profit inclination contribute to considerable capital retention and high administrative costs. He discovers that inflation reduces earnings while stock market gains increase net interest margin (Tashkandi, 2019).

(Jaara et al., 2021), researched the non-financial sector to examine if macroeconomic variables affect the Kenyan aviation industry's financial performance. This investigation included research. The analysis found that it affected Kenyan aviation enterprises' financial performance by 20%. 5% of the research found a weak positive, irrelevant relationship between ROA and GDP. It also finds a negative but weak link between ROA and the other macroeconomic variables. (Jaara et al., 2021) relationship studies led him to this conclusion. This discovery informs regulators and those responsible for macroeconomic aspects that MFIs need favorable economic variables to operate financially and promote sector growth. They should have strong macroeconomic variables and this will help MFIs do their jobs better and open up opportunities for economic growth.

Conceptual Framework

Independent variables

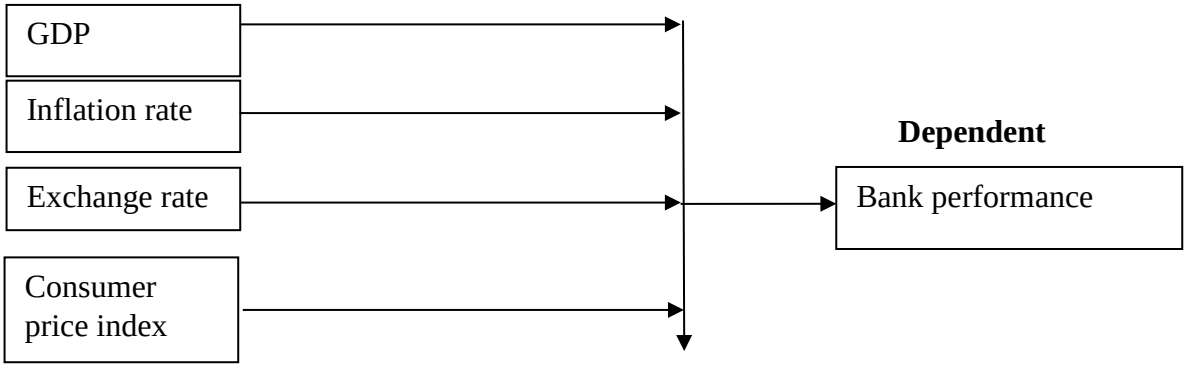

Figure 1 shows how macroeconomic variables affect financial performance. This acknowledges independent and dependent macroeconomic variables of 32 Ghanaian commercial banks.

Summary of Literature Review

The literature review academics have acknowledge independent and dependent macroeconomic variables that will be used to measure the financially performance of 23 Ghanaian commercial banks and several research studies are inconsistent with one another. Macroeconomic indicators and stock market indices were proven to have a correlation, as discovered by (Laub, 1999b). Because of the fact that the outcomes of the studies that were reviewed varied according to factors such as the variables that were included in the research, the level of industrialization in the nation that was examined, and the method of analysis that was applied, in order to achieve outcomes that are more consistent. Studies done in Ghana have neglected macroeconomic variables, including some that have produced inconclusive results. Henceforth, we acknowledge how different macroeconomic factors affect Ghanaian commercial banks (Saif-Alyousfi & Saha, 2021).

CHAPTER III

Methodology

Introduction

This chapter acknowledges the research approach that references the design, population, sampling tactics, instrumentation, data collection, and processing. This chapter examines how Ghana's commercial banks are measured.

This portion of our investigation or research will focus on different procedures, processes, or actions that are carried out in order to obtain essential informational data for the study. These procedures, processes, and actions will be discussed at length and given careful consideration in accordance with econometric standards. This article also discusses the regressors and regressands that were utilized in the process of conducting the regression in this research, as well as how and where these variables were gathered. In this section, we acknowledge and talk about the various statistical methods that were applied in order to conduct an analysis on the data that was acquired for this research.

Research Design

(“Financial Risk and Financial Performance of Listed Insurance Companies in Nigeria,” 2020), say a research design is a framework for gathering information. It specifies the information to be acquired from the source and how.

The research is descriptive and correlational. The researcher used empirical data from time series on the variables to figure out whether there was a positive or negative correlation between ROA.

Population and Sampling

Population

All 23 Ghanaian commercial banks operating between January 2001 and December 2021 will be included in this analysis. This target population provides statistics on how macroeconomic variables affect Ghanaian commercial financial performance (Sunder M & Prashar, 2020).

Table 3.1 list of 23 commercial banks in Ghana

Agricultural Development Bank of Ghana	GCB Bank Limited
Absa Bank Ghana Limited	Guaranty Trust Bank Ghana Limited
Access Bank Ghana Plc	National Investment Bank Limited
Bank of Africa Ghana Limited	OmniBSIC Bank Ghana Limited
CalBank Limited	Prudential Bank
Consolidated Bank Ghana Limited	Republic Bank Ghana Limited
Ecobank (Ghana) Limited	Société Générale Ghana Limited
FBN Bank Ghana Limited	Stanbic Bank Ghana Limited
Fidelity Bank Ghana Limited	Standard Chartered Bank Ghana Limited
First Atlantic Bank Limited	United Bank for Africa Ghana Limited
First National Bank Ghana	Universal Merchant Bank Limited
Zenith Bank (Ghana) Limited	

Sample Size

(Bucea-Manea-ţoniş et al., 2021), explained that a sample represents a population segment. The researcher can minimize time and money while increasing information. This analysis uses CBG-listed banks. This study used World Bank and CBG data from 2001-2021.

This research concentrated mostly on secondary sources of information as its major point of inquiry. In light of the fact that it gave background information and allowed comparisons to be made between earlier experiences and those that are now being had, the utilization of secondary data was deemed appropriate for this piece of research. In order to provide an explanation for a specific occurrence of interest, the gathering of data is an essential component of every research project. The term "data collection" refers to any method or practice of acquiring information. In order to provide an explanation for a particular occurrence of interest, the gathering of data is an essential component of every research project. This research, employed secondary data on macroeconomic factors to analyze the independent and dependent macroeconomic variables of 23 Ghanaian commercial banks. This line of investigation made use of secondary data, which was acquired from the databases of the World Bank, the Central Bank of Ghana etc. Those sources were the primary sources of information for this line of inquiry. The conclusion that can be drawn

from this is that the study was fruitful. This study examines a time range that spans twenty (20) years, beginning in 2001 and continuing all the way through 2021; however, its sample size only contains data from ten (20) years. One may find the following, among other places, an in-depth study of the aspects that were taken into consideration in this research:

Variables and Usage

All of the variables that were considered for use in this study were economic factors. Each of these variables has the potential to bring about change in an economy, which is why they are categorized as economic variables. Unprocessed data for each variable used in this study were collected for analysis as well as to draw conclusions or make policy recommendations as needed.

Growth Domestic Product (GDP)

GDP In this specific piece of study, growth is being used as a substitute for economic growth since it has been utilized in the context of comparing one historical period to the next. You have the option of expressing the sum using either nominal or real units, depending on how you feel about it (with inflation taken into account).

Total Reserve

The total reserves consist of monetary gold, special borrowing rights, assets owned by members of the International Monetary Fund (IMF) that are held by the IMF, and foreign currency that is subject to supervision by monetary authorities. At the end of each calendar year, the value of the gold holdings that are associated with these assets is calculated (Angkinand, 2009).

Descriptive Statistics

Descriptive statistics are statistics that may be used to describe or summarize elements of a sample or data collection. Some examples of descriptive statistics are the mean, standard deviation, and frequency of a variable. If we want to learn about the qualities shared by the individual parts of a data sample when it is considered as a whole, we can find it helpful to make use of inferential statistics. Data was obtained from the World Bank's World Development Indicator. When beginning a quantitative research inquiry, it is vital to make use of descriptive statistics right

away. These statistics not only help us to rationally reduce vast volumes of data, but they also give us a full overview in a format that is easy to deal with.

Property of Time Series Data and Stationarity

When doing empirical research, it is important to keep in mind that the non-stationarity of time series data might at times present a challenge. Working with non-stationary variables yields erroneous results or regression findings. During the entirety of the observation period, a stationary process will always have the same structure in terms of its mean, variance, and autocorrelation. The concept of stationarity in mathematics refers to a series that appears to be unchanging and does not follow any discernible trend. It also has a variance that is unchanging over time, an autocorrelation structure that does not change significantly over time, and does not exhibit periodic oscillations (Ruso Leon et al., 2021). To phrase it another way, the passage of more time does not affect the stationary series in any way. Before undertaking any form of regression analysis, it is of the utmost importance to first conduct a test to determine whether the data is stationary. This may be performed by employing either the Augmented Dickey-Fuller (ADF) test or the Phillips-Peron test and both of these are diagnostic procedures.

Procedure When One has a Data That is not Stationarily Aligned

In most cases, even though the data on the time series is not stationary, it is feasible to convert it in such a way that it is stationary by making use of one of the methods or procedures that are stated below: We are able to compare and contrast the data. It is possible to calculate the mean of the data. To put it another way, given the series Zt, we come up with a new series and assign it the symbol Yi, = Zi Zi 1. There will be a difference of one point between the differenced data and the original data when it is compared to the original data. Even though the data may be different more than once, in the majority of cases, just one difference is enough to distinguish the two sets of information.

If the data show a pattern, we can use that pattern to fit a curve to the data and then model the residuals that result. However, if the data does not show a pattern, we cannot use the pattern to fit a curve to the data. It is usual practice to employ a basic fit, such as a straight line, because the objective of the fit is merely to erase a long-term trend. This is because the purpose of the fit is to only eliminate the trend. Taking the logarithm or square root of the series is one method that has the potential

to stabilize non-constant variance. Another method is using the natural logarithm. Before carrying out the transformation on any negative data, you might want to supplement the data set with an appropriate constant first. All of the data will be converted into positive values because of this. When this constant is removed from the model, it is then feasible to get the projected values, which are also referred to as fitted values. This process can also be used to make predictions for future points.

Model specification

In this study, economic growth is measured using the gross domestic product. GDP acts as a predictor, while the total consumer price index, exchange rate, and inflation make up the independent variables while Bank assets return is the proxy for financial performance and dependent variable. The following can be used to indicate the relationship between the variables being described and those being discussed in a more nuanced manner:

$$\Delta BAR_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} BAR_{1-t} + \sum_{i=1}^{q} + \beta_{2i} \ln GDP_{t-i} + \sum_{i=1}^{q} \beta_{3i} \ln INF_{t-i} + \sum_{i=1}^{q} \beta_{4i} \ln {}_{t-i} + \sum_{i=1}^{q} \beta_{5i} \ln ER_{t-i} + et \ldots (1)$$

The GMM model used to analyze Ghana's financial performance from 2001 to 2020 is statistically represented in equation (1) above. The goal of this study was to determine how the level of public debt will affect the pace of economic growth in Ghana over the next 21 years and to look at the effects of macroeconomic factors on the financial performance of the commercial banking sector in Ghana. We use three different statistical tests to look at the model's validity, robustness, and reliability.

GMM Test

Moment conditions for the model in initial differences and moment conditions for the model in levels are combined in the system GMM estimator for dynamic panel data models. It has been demonstrated that it has a lower bias and lower root mean squared error than the GMM estimator in the first differenced model. In contrast, we demonstrate in this paper that the expected values of the concentration parameters in the differenced and level equations for the cross-section at time t are the same in the covariance stationary panel data AR (1) model when the variances of the individual heterogeneity and idiosyncratic errors are the same. This suggests that the equation in levels has a weak instrument problem as well. We then

demonstrate that the size distortions of the Wald tests and the 2SLS biases compared to the OLS biases are identical for the equations in differences and levels. These findings are demonstrated to apply to panel data GMM estimators.

Unit Root Test

Because this research used of data from a time series, it was judged important to explore whether or not the variable in issue or the data were stationary. This inquiry was carried out because it was thought to be required. In addition, before doing the cointegration test in time series or any other form of test analysis, it is vital to make sure that the variables in question are stationary. This is true whether the test is being run on time series data or on data from other kinds of analyses. The standard Augmented Dickey-Fuller (ADF) test, the Phillip-Perron test, and the Kwiatkowski Phillips Schmidt Shin (KPSS) test are all utilized because of this reason. The Augmented Dicky-Fuller test and the Phillips-Perron test are going to be the ones that are utilized in this study since they are the ones that are the most trustworthy and are able to best serve the aims of this research. The application or use of these tests led to the determination of the order in which all variables should be integrated. This led to the determination of the sequence that should be followed. The null hypothesis Ho, which is indicated by Ho = 0, states that "there is a unit root if the p-value is above the 5 percent significance threshold," whereas the alternative hypothesis (H1) states that H1 = 0. The alternative hypothesis (H1) states, "there is a unit root if the p-value is above the 5 percent significance threshold." (There is not a unit root in the data if the p-value is less than the significance criterion of 5 percent.) Throughout the entirety of each one of these assessments, the E-Views 12 Student Edition Lite was utilized.

The Augmented Dickey-Fuller (ADF) and PP unit root test

In order for (Akalpler, 2020), to test their hypothesis using a computer program, they devised and built the software themselves. The software also has the capability of determining whether the variable in question possesses both a unit root and an a priori random walk. You may make use of this information to determine application and utility of the expanded Dickey Fuller test. Hamilton (1994) provides four unique situations in which the test may be carried out. These scenarios are presented in order to demonstrate the test's applicability. The extended Dickey–

Fuller test handbook contains the situations that are being discussed here. The assumption that the variable in question has only a single unit root at each point in the distribution is the basis for the null hypothesis. This assumption lies at the foundation of the null hypothesis. The fact that the circumstances are different does not change the fact that this is true.

While selecting whether or not to include a drift term in the null hypothesis, these two aspects are highly important considerations to keep in mind and take into account when making the decision. The fundamental difference between this test and the Dickey-Fuller test is that this one is performed on the model rather than the other way around, as was the case with the test that came before it. This is the case since the Dickey–Fuller test was developed after this one. Given that this test was established after the Dickey–Fuller test, this outcome is to be expected. $\Delta yt=\alpha + \beta t+ \gamma yt-1+ \delta 1\Delta yt-1+\cdots+\delta p-1\Delta yt-p+1 + \varepsilon t$ … ……. 5.1.2

Since it comprises delays of the order p, the ADF formulation allows for the possibility of higher-order autoregressive processes to take place because of the space it provides for this possibility. Because of this, it is extremely important to determine the length of the lag period that existed before the test could be properly applied to the data. In order to reach this conclusion, this is a necessary precondition. The Phillips-Perron Test may be found in 3.10.2. The existence of a unit root is the null hypothesis for the Phillips-Perron (PP) test, whereas the absence of a unit root is the alternative. When the p-value exceeds a certain level, the null cannot be ruled out, and the series seems to be a unit root. The estimated regression, as opposed to the ADF test, only takes into account one lag of the dependent variable in addition to trend components. To take into account any serial correlation in the regression errors, a long-run variance estimator (currently Newey-West) is employed. The updated 2010 data and MacKinnon's regression surface approximation (1994) are used to obtain the p-values. The crucial values should be used to decide if the null hypothesis should be rejected if the p-value is close to being significant.

Granger Causality Test

It is possible, with the use of the tried-and-true Granger causality test, to determine which variable came first in the sequence of occurrences that resulted in the other variables (Bressler & Seth, 2011). The idea of error correction sometimes referred to as "ECM," will serve as the basis for this investigation. According to

ECM, although the past may be able to cause or predict the future, the future is unable to cause or predict the past. This is despite the fact that the past may be able to cause or predict the future. This is considered one of the foundational justifications in the examination. According to (Seth, 2007), X is regarded as the cause of Y if earlier values of X can be used to anticipate Y with a higher degree of accuracy than can earlier values of Y. This is one of the criteria that determine which variable is deemed the cause of the other variable. When establishing whether X is the cause of Y, this is one of the conditions that must be satisfied.

Yt = 0 + I = 1) ni y Yt1 Xt 1 ix + Ut n i=1 (9) and Xt = 0 + I= 1) ni y Yt1 Xt K ix + Yt n i=1 (10) Xt and Yt are the variables that need to be explored, whereas Ut and Vt are the words that indicate the white noise disturbance. Xt and Yt are denoted by the superscripts t and t, respectively. The alternative hypothesis, which asserts that I X 0 and I y = 0, is compared with the null hypothesis, which states that I X = I y = 0 for each and every i. Both hypotheses assume that the relationship between I X and I y remains unchanged. If the I X co-efficient is statistically significant but the I y co-efficient is not, then X is the cause of Y but not the other way around; the reverse is true if the I y co-efficient is statistically significant. In the event that the hypothesis is false, then Y must be the variable that is to blame for X. On the other hand, there is evidence of bidirectional causation in the event that the I X and I y co-efficient are both significant in their own right. Engle and Granger (1987), a group of variables is considered to be co-integrated of order (d, b), with the notation Yt = CI (d, b), if all of the components of Yt are integrated of order d or b (band d > 0), and there exists a vector = (1, 2... n) such that a linear combination YYt I = (Y1t + 2Y2t +, (d, b).

$$BP = \sum_{j=1}^{k} AJ\ ER\ t - i + \sum_{j=1}^{k} B_j GDP\ t - i + Uit$$

$$ER_t = \sum_{j=1}^{k} C_t ER_{t-1} + \sum_{j=1}^{k} D_j\ BP\ t - j + U2t$$

Equation 1 shows that the current BP is related to both the historical ER and the GDP. Equation 2 references the current ER and estimated coefficients on the bank performance (BP) in equation (1). The statistically different from zero as a group (that is, Ai 0), but the set of estimated coefficients on the lagging GDP 21 in equation (2) is not statistically different from zero (that is, Dj = 0), then there is unidirectional causality running from financial performance to GDP expansion. This can be

demonstrated if there is a discrepancy that is statistically significant between the estimated coefficients of the lagged foreign debt in equation (1). The correlation between BP and ER the exact opposite of what one may anticipate when evaluated from a single-directional perspective as this one does. A feedback or bidirectional causal link said to exist acknowledging bank performance and GDP coefficients in both regressions. This indicates that the relationship operates in both directions. This is sometimes referred to as a "causal loop" that operates in both directions. A feedback or bidirectional causal link is shown when the ER and GDP coefficients in both regressions have a statistically significant difference from zero. This indicates that there is a relationship that operates in both directions (Ruso Leon et al., 2021).

Model Stability Test and Diagnostics

Analyses of covariance and Pearson correlation were carried out to investigate the nature of the link that exists between the variables of the macroeconomic and the results of the commercial banking industry in Ghana regarding their financial standing. The researcher examined the influence of macroeconomic factors on the financial performance of Ghanaian commercial banks by using multiple regressions to do so. A number of factors, including the macroeconomic environment and the financial performance of commercial banks, determined it. Examining the links that exist between the predictor factors and the dependent variable, which in this case is the financial performance of the commercial banks in Ghana, required the utilization of the analytic framework.

A critical step is to assign a numerical value to the degree to which the data are related to one another. This can be accomplished by comparing the values of the residuals to the values that were predicted, as well as by demonstrating the value of the residual values in relation to the values that were projected. Alternatively, this can be done by comparing the values of the residuals to the values that were projected. Utilizing a concrete example is yet another viable option for achieving this goal.

Table 3.2 Variables Descriptions

V/No.	Variables	Symbols	Measure Units	Sources
1	Bank Performance	BP	(%)	World Bank
2	Growth Domestic Product	GDP	(Annual %)	World Bank
3	Inflation Rate	INF	(Annual %)	World Bank
4	Exchange Rate	ER	(2010 = 100)	World Bank
5	Consumer Price Index	CPI	(2010 = 100)	World Bank

Conclusion

We went into great depth and clarity discussing the most important aspects of this study's design, methodology, and organizational framework, all of which were based on data taken from the World Development Index (World Bank). Our sample was selected via a rigorous process, and the overall sample size spans ten years, from 2001 to 2021. We used a variety of technologies, including those that were essential for authenticating our data through (E-views 12), and organizational framework, all of which were based on data taken from the World Development Index (World Bank). First, we make use of the descriptive statistics that generated a summary of the entire variable that was employed in this research. Second, we use Augmented Dickey-Fuller and Phillips-Perrons to test for unit root. The Johansen co-integration test was carried out so that we could determine the amount of relationship that exists between our variables and establish whether or not our variables include long-term relationships. In the end, a number of diagnostics and stability tests, including the Breusch-Pagan, heteroskedasticity, or "white" test, as well as the serial correlation LM test, were carried out in order to assess the resilience of the model and determine how it may be regulated.

CHAPTER IV

Findings and Discussion

Introduction

The objective of this chapter is to review the various results and offer a comprehensive analysis of the pertinent graphs and tables. We initially assess descriptive statistics to determine the dependent and independent variables as well as the essential characteristics they exhibit since they give a summary of the variables used in this investigation. The interpretation of the Phillip Perron test and the Augmented Dickey-Fuller test will next be used to determine if the variables are stationary. The discussion that follows will address co-integration tests that can be performed by just running bound tests and their interpretations, which will help determine if performing GMM tests is required (Espejo, 2004). The Granger causality test, which is intended to tell researchers about the causal link between variables, was then carried out and extensively documented. There will be a debt analysis, a discussion of the applied regression, and recommendations for policy adjustments where necessary in addition to this chapter. The data was then put through a series of diagnostic procedures to assess its stability, and the findings were correctly interpreted. Using the conventional E-Views 12 paradigm, the variables were successfully run and accurately interpreted (Villacorta, 2021).

The results of the study show a favorable correlation between strong financial success and swift economic growth in the near term. However, the findings of a long-run regression study showed a substantial correlation between economic growth and bank performance as well as a negative relationship between the two. The financial sector significantly contributes to the growth of the economy by serving as a financial middleman and offering services including savings mobilization, risk management, research assessment, and transaction facilitation (Balke et al., 2021). Commercial banks must be able to help investors receive funding from depositors (deficit spending units) or from surplus spending units. This is possible as long as commercial banks are able to generate enough revenue to cover their operating expenses. Consequently, the banking industry must be lucrative in order for sustained intermediation to succeed and be profitable near term. However, the findings of a long-run regression study showed a substantial correlation between economic growth and bank performance as well as a negative relationship between the two. The financial sector significantly contributes to the growth of the economy by serving as

a financial middleman and offering services including savings mobilization, risk management, research assessment, and transaction facilitation. (Balke et al., 2021). Commercial banks must be able to help investors receive funding from depositors (deficit spending units) or from surplus spending units. This is possible as long as commercial banks are able to generate enough revenue to cover their operating expenses. Consequently, the banking industry must be lucrative in order for sustained intermediation to succeed and be profitable. However, a number of additional elements affect how effectively they work (Shmelev & Brook, 2021).

Table 4.1 Descriptive Statistic

	BP	**CPI**	**GDP**	**INF**	**ER**
Mean	24.86396	139.1857	5.883372	18.33800	87.74694
Median	25.24740	108.7285	5.600000	15.20528	88.55408
Maximum	39.24842	336.4929	14.04712	54.01291	110.0499
Minimum	8.995034	27.18164	0.513942	8.481073	67.12236
Std. Dev.	7.296902	97.74183	2.907107	10.44626	13.59260
Skewness	-0.234060	0.644730	0.782500	2.145351	0.044693
Kurtosis	2.873842	2.102817	4.348320	7.647723	1.778170
Jarque-Bera	0.205671	2.159190	3.733795	35.01002	1.313251
Probability	0.902275	0.339733	0.154603	0.000000	0.518598
Sum	522.1433	2922.900	123.5508	385.0981	1842.686
Sum Sq. Dev.	1064.896	191069.3	169.0255	2182.487	3695.175
Observations	21	21	21	21	21

Source: This Study

With a mean of 24.86396, bank asset return is identical to bank financial performance. With a value of 139.1857, the consumer price index, a macroeconomic indicator, has the highest mean in its category. The top item in this category is the consumer price index, which has a maximum value of 108.7285. The greatest figure for bank assets returned is 39.24842. (Al-Azizah et al., 2019) say that asymmetry and kurtosis values between -2 and +2 can be used to show that a normal univariate distribution exists. According to (Puteh & Azman Ong, 2017), If a piece of data has a skewness between -2 and +2 and a kurtosis between -7 and +7, it is considered to be normal. Any symmetric data should have a skewness that is near a kurtosis between -

7 and +7, it is considered normal. Any symmetric data should have a skewness that is near zero, as a normal distribution has a skewness of 0. A positive skewness number indicates a bias to the right, whereas a negative skewness value indicates a bias to the left.

ADF Unit root test

ADF, or enhanced Dickey-Fuller tests, are statistical procedures that may be used to detect if a time series sample has a unit root. The alternative hypothesis may have a variety of shapes depending on the test version, but it is frequently either stationarity or trend-stationarity. It is a more versatile application of the Dickey-Fuller test that works with a variety of intricate time series models. When used in the test, the augmented Dickey-Fuller (ADF) statistic yields an unfavorable result. The unit root hypothesis may be rejected as untrue with some confidence depending on how strongly it is negative.

Table 4.2 ADF Unit Root Test

ADF UNIT ROOT TEST				PP UNIT ROOT TEST		
Variables	Level	1st difference	Order/result	Level	1st difference	Order/result
BP	*0.9998*	*0.0000*	(1)	0.1297	0.0000	I(1)
GDP	*0.0425*	-0-	(0)	0.1375	0.0020	I(1)
INF	*0.0185*	-0-	(0)	0.0570	0.0008	I(1)
ER	0.7939	0.0116	(1)	0.6213	0.0408	I(1)
CPI	1.0000	0.0193	(1)	0.9730	0.0336	I(1)

Source: *Automatic selection, Schwarz Info Criterion.*

Table 4.2 lists the outcomes of the ADF unit root test. According to these findings, three of the five investigated variables are stationary at the initial difference. The relevant variables are BP, ER, and CPI, with p values of 0.0000, 0.0116, and 0.0193, respectively. Over this time, two of the five variables have remained at their starting points. The p values for these two variables, GDP and INF, are 0.0425 and 0.0185, respectively. The PP unit test result show that all of the variables are stationary at first difference. As a result, the GMM model will is for the regression analysis for the thesis.

According to (Muhammad Feisal & Karolina Br. Sebayang, 2018), definition, exchange rates may be defined as the price of one currency in relation to another. A free market's exchange rate is determined, just as it is in any other model that involves demand and supply for goods and services, by the competing forces of supply and demand. According to the efficient market hypothesis, exchange rates should accurately represent all available knowledge on the effects of external factors on the economy. According to (Antwi et al., 2020), preferences, variations in GDP, variations in inflation, variations in interest rates, and speculation are all factors that have an effect on the quantity of money that is in demand and available for exchange. Because the economy of Ghana is so open to trade, it is reasonable to anticipate that the rate of exchange will have some influence on the return on the stock market. It is said that the fundamentals of the economy are reflected in the value of the cedi.

According to (N. Khan & Malik, 2020), opinions, stock prices and inflation should have a positive correlation. Since ownership of common stocks represents ownership of actual goods, it follows that they should serve as a hedge against inflation. This is the logic behind this position. The consumer price index, often known as the CPI, has a significant influence on the stock market, according to research by (N. Khan & Malik, 2020). During his study of how macroeconomic factors affect the performance of the Nigerian stock market, John (2019) found that the price of stocks and the consumer price index (CPI) are related in a bad way. This is explained by the elevated chance of future financial success. Future profitability will decrease due to the price increase's impact on manufacturing expenses. Some people, however, maintain that higher prices can also boost stock prices since shares are utilized as a tool for hedging against inflation.

Table 4.3 GMM test result

Variables	Coefficient	Std. Error	t. statistic	Prob.
CPI	*0.071*	*0.019*	*3.736*	*0.0018*
GDP	*0.549*	*0.298*	*1.891*	*0.0842*
INF	*0.015*	*0.042*	*0.371*	*0.7152*
ER	*0.111*	*0.102*	*1.088*	*0.2925*
BP	*1.673*	*12.021*	*0.139*	*0.8910*
J- statistic	*1.89*			

The GMM technique takes into account many types of regression and displays the findings in Table 4.3, along with the coefficient, standard error, t statistic, and probability. The consumer price index has a considerable and positive impact on the financial performance of banks, according to the findings. This result is in line with (Ledhem & Mekidiche, 2022), examination of the relationship between the consumer and producer price indices and the accounting standards used to evaluate financial performance. Businesses that were registered on the Tehran Stock Exchange between 2002 and 2010 are included in the statistical population. (Ledhem & Mekidiche, 2020) used an endogenous growth model to study the relationship between Islamic finance's financial performance and economic development in Malaysia, Indonesia, Brunei, Turkey, and Saudi Arabia. They found that economic growth is significant at a 10% level and has a positive impact on financial performance. This result is also consistent with their findings. The dynamic panel system GMM was employed in the study to examine the impact of Islamic finance's financial performance on economic growth using quarterly data (2014-2018). The CAMELS system's features were taken into account while analyzing Islamic finance's financial success and GDP was employed as a measure of economic expansion. The findings showed that profitability as defined by return on equity is the only significant feature of Islamic finance's financial performance that drives endogenous economic development (ROE). In order to significantly contribute to economic growth, the experimental results also showed that additional financial performance criteria in Islamic finance need to be encouraged. As this study serves as a roadmap for academics, researchers, and decision-makers who want to promote Islamic finance in the banking sector in order to promote economic growth, it fills a gap in the literature by examining the relationship between Islamic finance's financial performance and economic growth. Additionally, although inflation is negligible, it positively affects bank financial performance. This result is consistent with research conducted by (Jagadeesh, 2015), on the long- and short-term links between inflation and financial development. (Ditzen, 2018), find that a positive short-run correlation between inflation and financial growth coexists with a negative long-run relationship using unbalanced panel data for 87 countries from 1960 to 2005. Similar results, however, are only shown in low-income or low-inflation countries when the data is split into different income or inflation groups.

Additionally, currency rates are beneficial to bank performance. This result is in line with (Jagadeesh, 2015), results, which looked into how South African commercial banks' financial performance was affected by inflation and exchange rates. Standard Bank, Nedbank, Capitec Bank, and First Bank were South Africa's top four commercial banks from 2003 to 2019. Return on equity served as the dependent variable in evaluating financial performance, while inflation and exchange rate served as independent variables. The GMM, ADF, and GCT models were used to achieve the goal of the study. The data revealed a minor inverse relationship between inflation and return on equity, as well as a minor relationship between exchange rate and return on equity.

Residual Diagnostic Tests

Table 4.4 Residual diagnostic tests

Name of tests	Test	T statistic	P value	Result
Jarque-Bera test	*Normality*	*5.296*	*0.0707*	*Normal distribuction of data*

Source: *E-Views 12*

Table 4.4 this finding agrees with the theoretical predictions. Residues typically make up around 5% of the whole frequency distribution. Since the probability of 0.7818 for the Jarque-Bera distribution exceeds the significance criterion of 0.05 percent, it cannot be deemed significant. Since the likelihood is not statistically significant, we may draw that conclusion. If the cointegration null hypothesis is true, normality in the distribution of the residuals is anticipated at the 5% level of significance.

Granger Causality Test

(Benk & Gillman, 2020), stated that causation in economics could be assessed by assessing how well a time series could be anticipated based on its prior values. Regressions frequently only reveal "mere" correlations, according to Clive Granger. Econometricians claim that the Granger test only detects "predictive causality" because the concept of "true causality" is deeply philosophical and because it is fallacious to believe that the mere fact that one thing occurs after another proves a connection by means of causation. According to (Laub, 1999a),

Granger-causality is best defined as "precedence," therefore using the word "causality" alone is misleading, according to (Nandialath & Rogmans, 2019). Alternatively, as Granger subsequently asserted in 1977, "they are temporarily connected."

Table 4.5 Granger Causality Test

Null Hypothesis	**OBS**	**F-Statistic**	**Probability**
CPI does not Granger cause BP	19	13.8969	0.0005**
BP does not Granger cause CPI		0.40454	0.6748
GDP does not Granger cause BP	19	1.18480	0.3347
BP does not Granger cause GDP		0.41105	0.06707
INF does not Granger cause BP	19	0.79845	0.4695
BP does not Granger cause INF		0.76043	0.4858
ER does not Granger cause BP	19	2.57495	0.1116
BP does not Granger cause ER		1.02368	0.3847
GDP does not Granger cause CPI	19	0.55316	0.5872
CPI does not Granger cause GDP		0.36043	0.7037
INF does not Granger cause CPI	19	3.27411	0.0682
CPI does not Granger cause INF		0.78922	0.47334
ER does not Granger cause CPI	19	2.35114	0.1317
CPI does not Granger cause ER		1.79796	0.2018
INF does not Granger cause GDP	19	0.63718	0.5434
GDP does not Granger cause INF		4.62875	0.0286**
ER does not Granger cause GDP	19	1.59592	0.2375
GDP does not Granger cause ER		1.22508	0.3234
ER does not Granger cause INF	19	1.11972	0.3539
INF does not Granger cause ER		8.82318	0.0003**

Source: *E-Views 12*

In Table 4.5 below, the findings of the Granger causality test are presented. The results show that there is only one causal direction of association between the consumer price index and the return on bank assets. Bank assets do not produce the consumer price index; rather, the consumer price index causes bank assets to return at a high level of 5%. In addition, there is a unidirectional causal link between

inflation and GDP growth. An increase in GDP is likely to result in inflation at levels over 5%, whereas an increase in inflation is less likely to result in an increase in GDP. When the level of significance is set at 5%, there is also a one-way causal link between the exchange rate and inflation. Although inflation is mostly a result of the exchange rate, the opposite is also true.

The performance of Ghanaian banks and the interest rate were shown to be negatively correlated in this study. (Nandialath & Rogmans, 2019), who discovered a similar inverse association between bank returns or performance and consumer price index, concurred with this finding. He examined the links between profits, stock returns, and an increase or decrease in consumer price index. He observed that both in the year of the consumer price index shift and the year after, surprise changes in consumer price index are positively correlated with unexpected earnings. This relationship arises from a positive association between operational income and consumer price index. According to (Asravor & Fonu, 2021), at the same time, there is a causal relationship between inflation and the increase in GDP that only goes one way. At levels over 5%, an increase in GDP is likely to give rise to inflation, whereas an increase in inflation is unlikely to give rise to an increase in GDP.

Cusum and Cusum of Squares test Results

Figure 4.1 and 4.2 Cusum and CUSUM of Squares results

Source: *E-Views 12*

The alternative hypothesis, which claims that parameters are always the same, is not supported by any data. The results of the test indicate that the blue line cannot go

across to the red line. Because of the consistency of the residual variances, we will go with the hypothesis of no effect and reject the alternative. This makes things more complicated. The residual variance is not prone to fluctuations; rather, it is stable. The GMM model with the macroeconomic and financial performance variables was evaluated with the use of the CUSUM and CUSUMQ computer programs. (Šoja et al., 2019), acknowledged it is possible to reject the null hypothesis of consistent coefficients at a significance level of 5% if any lines are found to be crossed. All CUSUM and CUSUMQ plots are required to remain inside the aforementioned bounds. This will maintain the status quo of the exchange rate. Both tests indicate that there is stability around the perimeter.

CHAPTER V

Conclusion and Recommendations

Conclusion

This study carefully examined the effect of macroeconomic variables on bank performance in Ghana over a 20-year period in order to identify the factors that are the most effective predictors of bank success. The objective of the study was to identify the variables that are the most trustworthy indicators of bank performance (from 2001 to 2021). The following macroeconomic variables were considered over the course of this research: bank performance (BP), the gross domestic product (GDP), inflation (INF), exchange rate (ER), and the consumer price index (CPI). Principal component analysis was the method that was used most often during the investigation to separate the most important variables.

According to this analysis, an improvement in bank performance will soon be proportionate to a rise in GDP. The long-term stability of the reserve, despite the fact that bank performance (BP) served as the study's nucleus, shows that there is a long-run bound connection between the dependent and independent variables. This finding suggests a positive relationship between bank performance and economic growth. According to the Keynesian hypothesis, it is a priori assumed that improved bank performance will hasten the pace of economic growth. This is in line with the theory's guiding principle. The outcome was not what was anticipated. However, research has revealed an inverse relationship between a country's total bank performance and its level of economic development.

Only when the GDP/capita, the consumer price index, and the inflation rate were included as dependent variables did the performance of the banks show a long-term relationship. Despite the fact that the GDP/capita is favorable for bank performance, rising consumer prices and inflation rates are hurting the sector's profitability. In summary, the consumer price index has a significant impact on the stock market. It serves as an input throughout the production process. Another crucial macroeconomic indicator that must be taken into account when assessing the state of the economy is the rate of inflation. Another common metric that may be used to assess the status of an economy is gross domestic product (GDP). One of the most crucial macroeconomic elements that might have a big influence on how much profit financial institutions make is the "exchange rate," which is the value of one currency in comparison to another.

Recommendations

After careful analysis, the following recommendations are forwarded:

- For the last decade, Ghana showed strong GDP/capita growth and trade volumes. To ensure that this factor continues to have a beneficial impact on bank performance, the government should put measures in place to keep the stable GDP growth rate.
- Another crucial result is that banks perform worse when interest rates and inflation rates are higher. To incentivize people with useful ideas, the government should implement a system with lower interest rates and control the inflation rates, especially at this time.
- Finally, as this research was limited to a few available macroeconomic factors, a further study with the inclusion of more macroeconomic factors that may affect bank performance might give a better picture of the banks' performance in Ghana.

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Appendices

Appendix

Appendix 1 Description Statistic

Date: 12/17/22 Time: 11:56
Sample: 1 21

	BAR	CPI	GDP	INF	REER
Mean	24.86396	139.1857	5.883372	18.33800	87.74694
Median	25.24740	108.7285	5.600000	15.20528	88.55408
Maximum	39.24842	336.4929	14.04712	54.01291	110.0499
Minimum	8.995034	27.18164	0.513942	8.481073	67.12236
Std. Dev.	7.296902	97.74183	2.907107	10.44626	13.59260
Skewness	-0.234060	0.644730	0.782500	2.145351	0.044693
Kurtosis	2.873842	2.102817	4.348320	7.647723	1.778170
Jarque-Bera	0.205671	2.159190	3.733795	35.01002	1.313251
Probability	0.902275	0.339733	0.154603	0.000000	0.518598
Sum	522.1433	2922.900	123.5508	385.0981	1842.686
Sum Sq. Dev.	1064.896	191069.3	169.0255	2182.487	3695.175
Observations	21	21	21	21	21

Appendix 2 ADF UNUT ROOT TEST

Unit root test BAR

Null Hypothesis: BAR has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		2.344513	0.9998
Test critical values:	1% level	-3.920350	
	5% level	-3.065585	
	10% level	-2.673460	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 16
Null Hypothesis: D(BAR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.651293	0.0000
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Appendix 3 GDP

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.103942	0.0425
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Appendix 4 INF

Null Hypothesis: INF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.515326	0.0185
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Appendix 5 ER

Null Hypothesis: REER has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.811560	0.7939
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(REER) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.761143	0.0116
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Appendix 6 CPI

Null Hypothesis: CPI has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		2.938402	1.0000
Test critical values:	1% level	-3.857386	
	5% level	-3.040391	
	10% level	-2.660551	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 18
Null Hypothesis: D(CPI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.216976	0.0193
Test critical values:	1% level	-4.571559	
	5% level	-3.690814	
	10% level	-3.286909	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations

Appendix 7 PP UNIT ROOT TEST

BP

Null Hypothesis: BAR has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.502414	0.1297
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

Null Hypothesis: D(BAR) has a unit root
Exogenous: Constant
Bandwidth: 9 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-8.547324	0.0000
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.

Appendix 8 CP

Null Hypothesis: CPI has a unit root
Exogenous: Constant, Linear Trend
Lag length: 1 (Spectral OLS AR based on SIC, maxlag=1)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.519483	0.9730
Test critical values:	1% level	-4.498307	
	5% level	-3.658446	
	10% level	-3.268973	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(CPI) has a unit root
Exogenous: Constant, Linear Trend
Lag length: 1 (Spectral OLS AR based on SIC, maxlag=1)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.891825	0.0336
Test critical values:	1% level	-4.532598	
	5% level	-3.673616	
	10% level	-3.277364	

Appendix 9 GDP

Null Hypothesis: GDP has a unit root
Exogenous: Constant, Linear Trend
Lag length: 0 (Spectral OLS AR based on SIC, maxlag=4)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.078989	0.1375
Test critical values:	1% level	-4.498307	
	5% level	-3.658446	
	10% level	-3.268973	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant, Linear Trend
Lag length: 0 (Spectral OLS AR based on SIC, maxlag=4)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.363289	0.0020
Test critical values:	1% level	-4.532598	
	5% level	-3.673616	
	10% level	-3.277364	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations

Appendix 10 INF

Null Hypothesis: INF has a unit root
Exogenous: Constant, Linear Trend
Lag length: 0 (Spectral OLS AR based on SIC, maxlag=4)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.586877	0.0570
Test critical values:	1% level	-4.498307	
	5% level	-3.658446	
	10% level	-3.268973	

Null Hypothesis: D(INF) has a unit root
Exogenous: Constant, Linear Trend
Lag length: 0 (Spectral OLS AR based on SIC, maxlag=4)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.875689	0.0008
Test critical values:	1% level	-4.532598	
	5% level	-3.673616	
	10% level	-3.277364	

Appendix 11 ER

Null Hypothesis: REER has a unit root
Exogenous: Constant, Linear Trend
Lag length: 0 (Spectral OLS AR based on SIC, maxlag=4)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.891596	0.6213
Test critical values:	1% level	-4.498307	
	5% level	-3.658446	
	10% level	-3.268973	

Null Hypothesis: D(REER) has a unit root
Exogenous: Constant, Linear Trend
Lag length: 0 (Spectral OLS AR based on SIC, maxlag=4)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.786071	0.0408
Test critical values:	1% level	-4.532598	
	5% level	-3.673616	
	10% level	-3.277364	

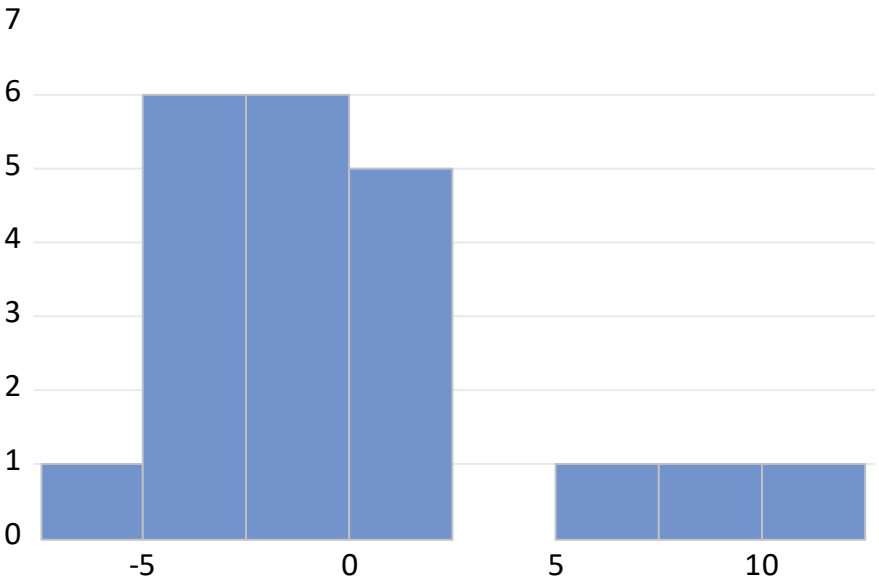
*MacKinnon (1996) one-sided p-values.

Appendix 12 GMM METHOD

Dependent Variable: BAR
Method: Generalized Method of Moments
Date: 01/17/23 Time: 12:18
Sample: 1 21
Included observations: 21
Linear estimation with 1 weight update
Estimation weighting matrix: HAC (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)
Standard errors & covariance computed using estimation weighting matrix
Instrument specification: CPI GDP INF REER
Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI	0.071106	0.019031	3.736394	0.0018
GDP	0.549107	0.298190	1.841466	0.0842
INF	0.015740	0.042384	0.371364	0.7152
REER	0.111391	0.102330	1.088554	0.2925
C	1.673573	12.02156	0.139214	0.8910

R-squared	0.628627	Mean dependent var	24.86396
Adjusted R-squared	0.535784	S.D. dependent var	7.296902
S.E. of regression	4.971626	Sum squared resid	395.4730
Durbin-Watson stat	1.989282	J-statistic	1.89E-44
Instrument rank	5		



Series: Residuals
Sample 1 21
Observations 21

Mean	6.77e-16
Median	-1.093413
Maximum	11.99871
Minimum	-7.486547
Std. Dev.	4.446757
Skewness	1.091800
Kurtosis	4.133522
Jarque-Bera	5.296361
Probability	0.070780

Appendix 13 RESIDUAL DIAGNOTIC

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	3.746076	Prob. F(13,5)	0.0768
Obs*R-squared	17.23088	Prob. Chi-Square(13)	0.1890
Scaled explained SS	0.805312	Prob. Chi-Square(13)	1.0000

Appendix 14 GRANGER CAUSALITY TEST

Date: 12/17/22 Time: 12:14
Sample: 1 21
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
CPI does not Granger Cause BAR	19	13.8969	0.0005
BAR does not Granger Cause CPI		0.40454	0.6748
GDP does not Granger Cause BAR	19	1.18480	0.3347
BAR does not Granger Cause GDP		0.41105	0.6707
INF does not Granger Cause BAR	19	0.79845	0.4695
BAR does not Granger Cause INF		0.76043	0.4858
REER does not Granger Cause BAR	19	2.57495	0.1116
BAR does not Granger Cause REER		1.02368	0.3847
GDP does not Granger Cause CPI	19	0.55316	0.5872
CPI does not Granger Cause GDP		0.36043	0.7037
INF does not Granger Cause CPI	19	3.27411	0.0682
CPI does not Granger Cause INF		0.78922	0.4734
REER does not Granger Cause CPI	19	2.35114	0.1317
CPI does not Granger Cause REER		1.79796	0.2018
INF does not Granger Cause GDP	19	0.63718	0.5434
GDP does not Granger Cause INF		4.62875	0.0286
REER does not Granger Cause GDP	19	1.59592	0.2375
GDP does not Granger Cause REER		1.22508	0.3234
REER does not Granger Cause INF	19	1.11972	0.3539
INF does not Granger Cause REER		8.82318	0.0033

Appendix 15 CUSUM and CUSUM of Squares test Results