

## **APPROVAL FORM**

The undersigned certify that they have supervised the student **James Dambaza**'s dissertation entitled; **The impact of planned budget deficit on stock market returns in Zimbabwe (2009-2016)** submitted in partial fulfilment of the requirements of Bachelor of Commerce in Banking and Finance Honors Degree at the Midlands State University.

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## **DEDICATION**

I dedicate this piece of work to the Lord and my loving family who made it possible for me to complete this work.

## **ACKNOWLEDGEMENTS**

I would like to thank the Lord, Almighty, for the undeserved love and kindness he has shown me and for awarding me an opportunity to study Banking and Finance at Midlands State University. Furthermore, he gave me the power, determination, intelligence and made all things possible for me. My deep gratitude goes to my supervisor Mr F. Mhere the unwavering effort and guidance he offered in supervising this research project into the desired form. I would also like to extend my special gratitude to the department of Banking and Finance, with special thanks to Dr.N. Nkomazana and Mrs V. Santu.

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## ABSTRACT

The notion that chronic budget deficits impose costs on the stock market performance through depriving the private investors of the much-needed foreign currency and rising short and long-term interest rates, has been generally recognized by experts in finance and the popular financial media. In Zimbabwe over the years, the local stock market has not been providing capital up to sustainable levels that promote business, economic growth, development, improve standards of living and most importantly ease the persistent high cost of doing business in Zimbabwe amid the persistent government budget deficit problem that plays a significant role in crowding out the private investors and companies of the much-needed capital to finance their operations and this often diminishes the stock market returns. This motivated an investigation on the potential impact of planned budget deficit on stock market performance, with the aim of coming up with policy recommendations that will revive the stock market performance, help ease the budget deficit problem and boost economic performance. Using monthly time series data stretching from 2009 to 2016 and OLS regression, the study examined the impact of government budget deficit on stock returns with a model that included other macroeconomic factors which influence stock returns such as money supply, consumer price index and real interest rates. Diagnostic tests such as normality, heteroskedasticity, multicollinearity and model specification were run before model estimation. The research findings revealed that the government budget deficit has a positive significant impact on stock returns and also indicated that consumer price index is an influencing factor in determining stock returns performance. More so, the study results showed positive coefficient signs on all variables included in the model and a total of 2 out of four were statistically significant namely budget deficit and consumer price index. The study recommended the need to formulate policies and strategies that are aimed at enhancing industrialisation, enforcing developmental expenditures by government and supporting the private sector and the shadow economy through financial infrastructure development that reduce the cost of doing business. This is aimed at stimulating companies' performance and strengthen the government's tax systems collection to ease the budget deficit problem since it contributes to the well-being of the economy.

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## ACRONYMS

ADF	Augmented Dickey Fuller
CLRM	Classical Regression Model
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IMF	International Monetary Fund
MOF	Ministry of Finance
RBZ	Reserve Bank of Zimbabwe
VAT	Value Added Tax
ZIMRA	Zimbabwe Revenue Authority
ZIMSTAT	Zimbabwe National Statistical Agency
USA	United States of America
ZSE	Zimbabwe Stock Exchange

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# CHAPTER 1: INTRODUCTION

## 1.1 Introduction

The government budget deficit phenomenon remained an unending theme of much debate among government officials and general stakeholders since the budget deficit's increase causes indispensable consequences on stock market returns' performance. Planned budget deficit refers to negative balance between government revenues and government spending. An increase in the size of budget deficit frequently generates problems for the government and policy makers since it often robs the private sector of the much-needed capital, reduces stocks prices, causes decline in the competitiveness of the local products on the global markets and eventually affect investor confidence as their participation on the stock market will be compromised. Recurring of the budget deficit is often a consequence of increased government expenditure, poor administration, the existence of corruption in government dealings, a decreasing tax base and unsustainable increase in interest rates, among others. However, on the other hand deficits might bring in the subject of empowerment through developmental expenditure which in turn provides employment and generates income which is spent in the economy. Therefore, because of these probable negative and positive implications, the government budget deficit and its impact on stock market returns is a pervasive spectacle that needs to be vigilantly analysed and Zimbabwe included.

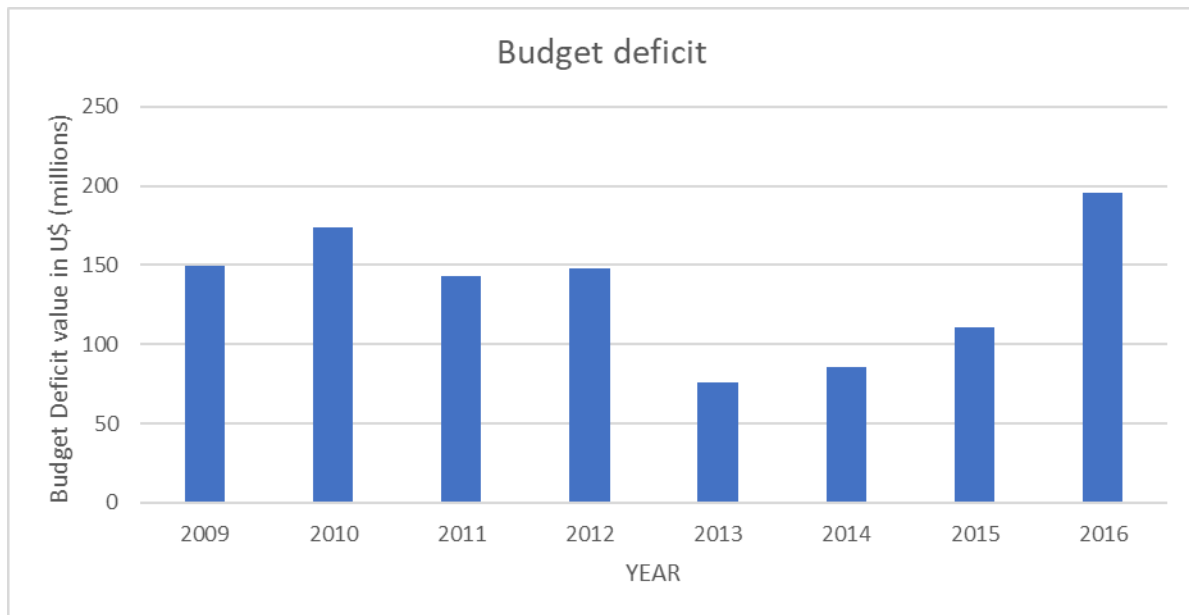
## 1.2 Background of the Study

The Zimbabwean government over the past years has repeatedly reported fiscal deficits and they have since been considered as the blight of the economy due to enormous challenges in mobilising revenues to foster economic growth and improved business performance. After surviving a possible death during the 2008 hyperinflation, the ZSE endured a series demise of companies amid insolvent and bankruptcy challenges. At least 16 major companies were delisted from the Zimbabwe Stock Exchange since 2009 and this is the time Zimbabwe adopted a basket of foreign currency to eliminate the hyperinflationary blight which left every Zimbabwean clueless and miserable. From the 16 companies that have been delisted, 8 have done so voluntarily while the remainder were forced to delist when it was found that they were facing insolvent challenges. Cairns Foods, David White Head, Barbican Holdings, Stealnet, Apex, Interfin and Trust Holdings. The delisting was principally caused by liquidity challenges constraining companies from raising money on the local stock market and also the inability to attract new investors to bring in cash. Liquidity problem in the country has made

it impossible for companies to finance its operation through the local bourse and of the few that are managing get the money from off show investors.

Subsequently, the planned deficit has been broadening from the time Zimbabwe abandoned its currency in February 2009. Dependence on International donor institutions namely the International Monetary Fund (IMF) and the World Bank, and many other well recognised regional allies and financiers such as the African Export-Import bank (Afreximbank) remained outstanding source of external funding to bail out the government of Zimbabwe in realising economically necessary government spending. Upon the official coming in of the foreign currency on 9 February 2009, ZSE performance was rejuvenated but this development failed to reduce the massive liquidity crisis and low investor confidence continued to suppress economic activities.

This crippled most government and private operations in the economy and somehow hindered the planned budget in its efforts to try and revive production. In 2013 a planned deficit amounting to US\$ 0.217 billion was realised from disposable revenues accumulated to US\$3.42 billion contrary to a mark of US\$3.63 billion. Many challenges that created an unfavourable and difficult business environment dominated the Zimbabwean economy without significant foreign direct investments and low investment levels. This was affirmed by a government deficit amounting to US\$0.22 billion in 2014 amid excessive government expenditure during the 2013 national election. More so, in 2015 the country 's budget deficit registered a sharp increase amounting to US\$270 million. Furthermore, evidenced by the inability to meet revue collection goals by the Ministry of Finance and Economic Development in years stretching from 2013 to 2016, a ZIMRA (2016) report confirmed the budget deficit in 2016 remained high and expanding. The budget performance from 2009 to 2016 is depicted below in the figure 1.1.

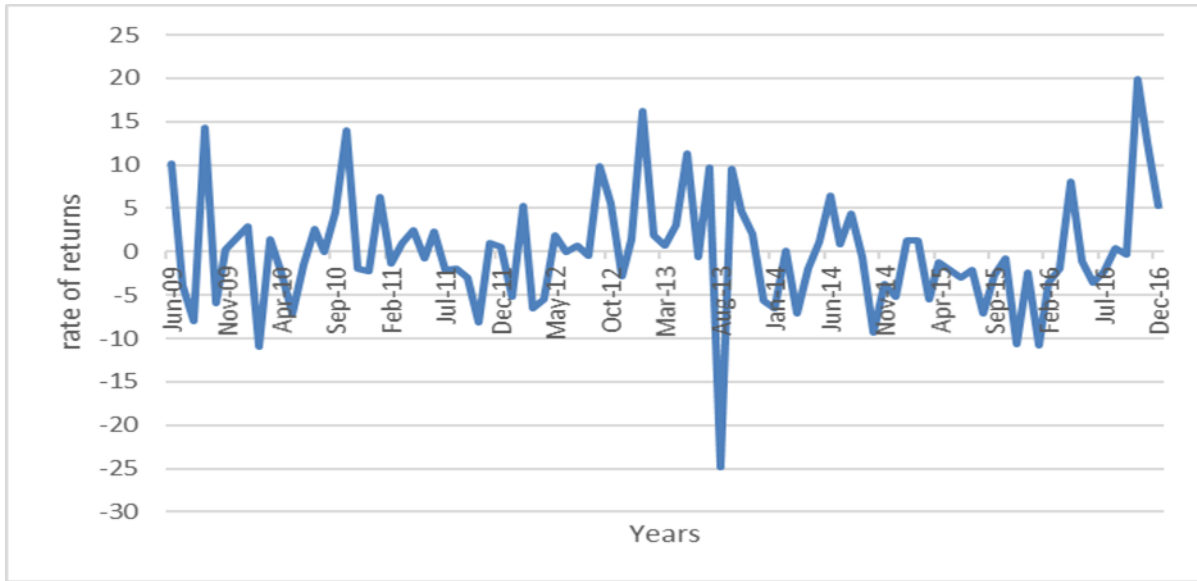


**Figure 1.1 Bar graph of Budget Deficit (2009-2016)**

**Source: RBZ**

As revealed in figure 1.1 a high rise in budget deficit experienced by the government of Zimbabwe from period 2013 to 2016. Therefore, such long-lasting and ever-increasing government budget deficits did not retiringly impose cost on the business world but the whole economy at large and the stock market has not been spared. This has since reduced consumer confidence in participating on the local stock market. In addition, the firms' ability to entirely and confidently borrow at affordable costs, and hence forth it depressed companies to fully, competitively and effectively participate on the capital market. However, the public sector started crowding out the private sector for the constrained US dollar circulating in the local market. This has resulted in Government through the Reserve Bank of Zimbabwe issuing an array of Treasury Bills in the local market in order to finance its planned budget deficits and hence mopping out the very little liquidity available in the local market. At the same time, we have seen companies failing to competitively out perform in an environment with a pool of low-priced imports dominating the domestic market because the general public shifted to these cheaper imports due to seriously declining employment levels and low-income level.

The suppressed government expenditure from 2013 up to 2016 coincide with a persistent volatile stock market performance. The trends of stock market performance on the local bourse are depicted in figure 1.2.



**Figure 1.2: Trends of Stock Market Returns (2009-2016)**

**Source: ZSE**

The trends in figure 1.2 depict the oscillations of stock market returns performance from 2009 to 2016. From the period 2009 up to 2012 it can be seen that the returns were fluctuating at steady rate approximately within -5% to 13%. However, the local bourse nosedived in 2013 and set an all-time record of -25% in the history of Zimbabwe Stock Exchange amid lack of investor confidence emanating from uncertainties in business policies and government policies after the 2013 election. After this drastic decline the local capital market registered a bullish sentiment stretching up to 2016. The bullish sentiment registered remained sceptical as general economic activities continue to slowdown though at a decreasing rate.

Therefore, introspection of these trends of government budget deficit and stock market performance may in any case not be sufficient to parade convincing illustrations of the nexus between planned budget deficits and the stock market returns performance, which consequently makes the contemporary study helpful. Regardless of the fact that the local capital market contribution to economic revival and growth is being hindered by the current unfavourable economic conditions, the Zimbabwe Stock Exchange at this time is performing well in view of local averages. However, the tenacious budget deficits and rising variances in stock market returns stands a cause of concern. The prevailing economic circumstances which have seen exorbitant government expenditure continue to pose serious threats to private sector financing from the local stock market and the economy at large, therefore



motivating the need to investigate the impact of planned budget deficits on the stock market returns with the aim to ascertain measures on stabilising the local capital market which is able to provide accessible finance by the local businesses.

It is believed that high budget deficits should impact negatively on the performance of the stock market (Nyamute, 1998). This can be partly attributed to the fact that a country that runs a huge budget deficit will have to attract more foreign capital to finance their operations in the form of loans and hence this may lead to relatively high interest rates which will negatively impact the stock market. This is so because the government debt is less risky as most investors believe that government use whatever means to settle its obligations. It is recently that we see most of the government failing to settle their obligations and the case in point is Zimbabwean government. However, the Ministry of Finance and Economic Development has worked out a number of ways in repaying some of its debts to the international institutions as evidenced by the recent repayment that the government made to International Monetary Fund (IMF) in 2016.

#### **1.4 Statement of the Problem**

Over a prolonged period of time Zimbabwe has faced challenges in raising capital through the local stock market and this stands as a consequence of the immense deindustrialisation coupled with a series of macroeconomic problems predominant in the economy. As highlighted in the background, from 2013 we have seen an increase in planned budget deficits implying that over the years the government of Zimbabwe could not mobilise adequate finance to fund its spending thereby revolving to internal borrowing and seeking outside finances. However, since regional and international communities could no longer be banked on, the remaining option became the precondition to raise cash through the issuance of an array of Treasury Bills. Consequently, the Zimbabwe Stock Exchange remained less efficient in generating sufficient capital for both local foreign investors and continued to suppress investors from sustainable and favourable stock returns. Therefore, unpredictable variances between unstable government budget deficits over the years, the stock market's performance and lack of conclusive evidence on the impact of planned budget deficits on stock market returns in Zimbabwe, gives more enthusiasm on the need to investigate the potential impact of the planned budget deficits on stock market returns in Zimbabwe.

## **1.5 Objectives of the Study**

The study's main objective is to establish the extent to which stock prices at the Zimbabwe Stock Exchange take into account all publicly available information on fiscal policy actions in Zimbabwe. Sub-objectives include:

- To determine the effects of government budget deficits on the performance of stock market in Zimbabwe.
- To investigate whether changes in planned budget deficits cause changes in stock market returns in Zimbabwe and if so, in what direction?
- To draw inferences about market efficiency with respect to government budgets and other policy actions.

## **1.6 Research Questions**

The study is to answer the subsequent questions:

- Do stock prices at the Zimbabwe Stock Exchange take into account all publicly available information on fiscal policy actions in Zimbabwe?
- Do planned budget deficits cause changes in stock market returns in Zimbabwe and if so, in what direction?

## **1.7 Statement of Hypothesis**

The researcher acknowledged the following comprehensive hypothesis for the study:

Ho: Government Budget Deficits do not have a significant impact on the stock market returns

Hi: Government Budget Deficits have a significant impact on the stock market returns

## **1.8 Significance of the Study**

This study does not seek to resolve the Stock Market Efficiency (SMH) debate but the aim is to conceal the gap that preceding studies left. Previous studies carried out in Zimbabwe were on the factors that affect stock market performance notably by Kosmas *et al* (2007). More so, Petros (2012) investigated the relevancy of the Efficient Market Hypothesis on the ZSE and then Chikoko and Muparuri (2013) tested the efficiency of the local bourse post dollarization. Hence, it is of paramount importance to note that the majority these researches in literature focused on the local capital market's efficiencies and factors that influences its performance but however, they do not provide a conclusive and convincing direct relationship between government budget deficits and the stock market returns' performance.

Therefore, basing on this background this study will cover the gap in available literature by investigating the impact of budget deficits on stock market returns. The existence of inadequate literature on the topic under study gives this research a fertile ground to investigate accordingly for the period spanning from 2009 to 2016.

## **1.9 Assumptions**

Assumptions relating to how the study would be conducted are as follows:

- Zimbabwe Stock Exchange will continue in existence
- All stock market participants have homogenous objectives

## **1.10 Limitations of the Study**

- Though the Ministry of Finance and Economic Development and the Zimbabwe Stock Exchange might have all the figures of the variables to be used, there are continuous revisions of the figures published and at times with different sources you can get different figures, however the research managed to acquire a reliable set of data from the Reserve Bank of Zimbabwe.

### **1.10.1 Organisation of the Study**

Succeeding chapters are arranged as follows:

Literature on the foregoing study will be analysed in chapter 2. Foundation of the study will be established and cemented in this chapter as the author will critically review both empirical and theoretical literature. Chapter 3 stretches more on the methodology and model of the study. Justification of the variables presented in the adapted model is done in this chapter riding on the empirical evidence provided in chapter two. Model estimation, diagnostic testing and presentation of results will be established in chapter 4. Conclusively chapter 5 will present summary of the study, conclusions of the study hypothesis, policy recommendations and suggestions for supplementary studies.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

The chapter seeks to identify a gap in literature which motivates the study and provides a critical review of literature on information from other researchers who have carried out their research in the same field of study. It seeks to cover theoretical backgrounds which include key theories in support of the fiscal policies and finally review empirical evidence established by other researchers across the region and the globe at large.

### **2.2 Theoretical Literature Review**

In this section the study present selected theories relating to the topic in a move to lay out the foundation and solidify on the point of departure in support of the current study.

#### **2.2.1 Economic Theory**

Fama (1981) advanced the economic theory in which he concluded that growth in the money supply will propel a rise in discounts rate that will eventually cause a decrease in the value of stock investments because investors will shift their investment into the money market and any other debt instruments. This run from the stock market will then reduce the demand for stocks and the prices fall resulting in lower returns.

However, it should be noted that the above case cannot stand holding others factors constant and provided that growth in money is targeted towards economic developmental projects through the provision of subsidies to companies in order to lessen firms' burden in their operations. This will improve business performance and in turn shift the prices of stock upwards and stock returns increase.

#### **2.2.2 The Ricardian Equivalence Theory**

The notion is credited to Barro (1989) which states that economic policy actions do not affect the stock exchange market claiming that the stock market is efficient. It postulates that consumers are forward looking and so do internalise the government's budget constraint when deciding on consumption patterns. Barro's model assumed the following:

- families act as perpetual dynasties due to explicit intergenerational humanity

However, people cannot live in perpetuity and they do not actually give maximum regarding taxes levied on them after death because individuals only capitalize on taxes that are currently paying. Thus, similarly in the Standard Approach the desired private savings not rise by

enough to offset fully a decrease in government saving which will then suppress private investors on the stock market as they get attracted by higher interest rates on government securities.

- there is no imperfection in capital markets, thus all can borrow and lend at single rate.

The theory also fails on its intuition of perfect credit markets. Loans repayment is implicitly guaranteed by the government through its tax collections and debt payments, hence forth loans between people who have explicit access and those with poor access transact despite its cut viability due to transaction costs on the imperfect credit market.

- Government expenditure follows a fixed pattern.

There is always an uncertainty about individuals' future taxes, hence forth explicitly implies variations in government expenditures. Therefore, the complexity in estimating future taxes implies high rate of discount in capitalising the future obligations. It eventually follows that budget deficits raises aggregate consumer demand and reduces desired national saving which tends to raise with a budget deficit if these uncertainties increase and hence forth the activities on the stock market are constraint resulting in lower prices on the stock markets as individuals concentrate on consumption instead of speculation motives.

The Ricardian Equivalency goes hand in hand with the Stock Market Efficiency (SME) hypothesis. The (SME) proclaims that the stock exchange market prices completely reflect all available information, hence economic policy actions do not impact the stock exchange market activities.

### **2.2.3 Fiscal Theory**

The intuition was developed primarily by Leer (1991). According to the fiscal theory, if government has an unsustainable fiscal policy to the extent that it will not be able to service its debts in future from the tax revenue, the result is that the debt has to be paid through an inflated debt. Fiscal theory contracts with the monetary in that it centres price level manipulation on the fiscal action by the government rather than price level being determined by the forces of supply and demand for money as postulated by monetarists. Hence, it is of paramount importance that the fiscal discipline should be a priority in order to strike a stable budget throughout the economic cycle. More so, the policy maker has to note that inability to maintain this balanced budget is inflationary in the long run.

## **2.2.4 Crowd Out Effect Theory**

The theory claims that unsustainable increase in government spending or reduction in tax revenue will result in a planned budget deficit that is to be financed by increased government borrowing from the domestic market through issuance of attractive and high yielding securities. This unintended increased borrowing results in an increase in interest rates that will eventually shift the liquid providers from providing funding for cash hungry private firms and hence constrain or push out private investment. However, the intuition is heavily criticised as it depends on the state of the economic structure within a country and the strategic policies that a government would have employed to curb the deficit. Prolonged deficits that are funded by the issuance of attractive and convincing return but less risk government securities will eventually translate to expensive issuance by corporates for long term investments hence driving private investors away.

## **2.2.5 Keynesian Model**

This theory was advanced by the Keynes in the late 1993 in which they solely navigated from the monetary policy side despite arguably facing accusations from fiscal theorists in that monetary policy cannot raise income and it is against this background that a number of scholars argue that these Keynesians did not have liquidity trap in mind upon this intuition. The theory strongly trusts that aggregate demand is predisposed by both public and private sector and it sometimes swings at the equilibrium with the private and public influences. It states that low interest environment helps to increase investments; income and that will propel growth in individual savings. However, some academics have portrayed John Maynard Keynes as a deficit loving interventionist but particularly as evidenced by also his believe that booms and busts were integral indications of modern capitalism and the prolonged accumulation of reserves during the time of surpluses should equally enable the government to address a severe recession and still maintaining a very low debt ratio.

## **2.3 Empirical Literature Review**

Ifuero and Ester (2012) had prior steered an empirical research on the relationship between macroeconomic variables and stock market index of the Nigerian economy for the period 1975-2005. The study measured the yearly data of several macroeconomic variables namely interest rates, inflation rates, exchange rates, fiscal deficit, GDP and money supply. The typical goal was to try to reveal the relative influence of these variables on stock market returns performance of the Nigerian Capital Market. Therefore, in fulfilment of this, the

Vector Error Correction Model (VECM) was used to study the short-run dynamics as well as long run relationship between the stock market index and the six selected macroeconomic variables from the Nigerian economy. The VECM regression results indicated that inflation rate, GDP, exchange rate, lagged stock market index and money supply do have mixed influence on stock market returns either in the short-run or long run while they were discrepancies between short-run results. On the other hand, fiscal deficit was positively related to stock market returns implying that rising and monetised federal deficits helped to raise the level of money supply in the economy and this impacts generally on all prices in the economy and stock prices inclusive. These results assisted to establish grounds on strategic devising of policies that would help to improve the Nigerian economy's stock market performance and eradicate the budget deficit problems. Ifuero and Ester's study was a remarkable literature masterwork in the spares of stock market returns performance and it established a foundation for other researches that endeavoured to investigate the influence of budget deficits on stock market returns performance in Africa in subsequent years.

More so, Faiza *et al* (2012) carried out a study on the casual relationship between budget deficits and stock prices in Pakistan and India utilising time series for the period 1990-2010. Using the Granger Causality Test to find out the long run casual relationship between budget deficits and stock prices, the study formulated a model based on annual data for budget deficits and stock prices for both countries. The research study used annual data on budget deficit as a percentage of GDP and stock price return (KSE 100 Index, BSE 200 Index) from 1990 to 2010. Findings from the research presents evidence from Pakistan that reveals the existence of a long run positive causal relationship between budget deficits and stock prices. Faiza *et al* suggested that the reasons for this positive relationship were due to economic conditions, they lamented that Pakistan was not fully employed and the developmental expenditure were too high as compared to current expenditures. More so, they argued that structural deficit has typically risen during the recessions and then dropped in the subsequent expansions. However, India presented a long run negative relationship amid high current expenditure. The findings for India further indicated that as deficits increase, futures tax burden, the dollar's value and interest rate increase ant this tends to lead to decrease in corporate profits due to weak domestic and export revenues that will eventually cause a decrease in sales which ultimately net earnings, thus decreasing equity returns. The key policy recommendations indicated that there is a need to formulate strategic policies which are aimed at smart resource utilisation and government should induce initial capital to

promote industrialization. Faiza's study is still regarded as a profound work in the literature of stock market development and the findings deepened the need to examine casual effect of budget deficits for Pakistan and India. This is likely also to hold in Zimbabwe especially after noticing that all these nations are undeniably emerging countries.

Riding on the same motion, most empirical studies in literature are providing evidence of a positive effect of budget deficit on stock market returns, Osamwonyi and Osagie (2012) based in Nigeria had similar result. Using Vector Error Correction Model (VECM) they analysed the nexus between stock market returns with a number of macroeconomic variables and budget deficit inclusive for the period 1975 to 2005. On the basis of this positive relationship the study advised the Nigerian government to improve the administration of national government expenditures so as to reduce the direct of budget deficit on stock market returns. Moreover, these results found a strongly coincides with the economic theory and the neo-classical theory view that a deficit will create a deflationary environment through managed monetary policies that favours the stock market development and returns inclusive.

Igbinedion *et al* (2013) established a negative relationship between planned budget deficit and stock markets prices with their investigation on the effects of fiscal deficits on stock prices in Nigeria. Utilising Vector Auto-Regression (VAR) and Error-Correction Mechanisms (ECM) with annual time series data spanning 1984-2010, budget deficit, broad money, interest rates, volume of transactions, inflation rate and private consumption expenditures were the independent variables and stock prices as dependent variables. The findings revealed, amongst others, that planned budget deficit, interest rates and money supply had a negative impact on stock prices. The research in light of the foregoing findings recommended that the government should place greater premium on the employment of fiscal encouraging packages that go together with financial discipline since fiscal deficits have the possibility to pose the multiplier effect on stock prices.

Stephen (2014) analysed effects of macroeconomic factors on stock returns at the Nairobi Stock Exchange for the period 2008 to 2012. Cross Sectional analysis was used to establish the relationship between interest rates, inflation and budget deficits with stock market returns at the Nairobi Stock Exchange. Findings from the study indicated that budget deficits (BD) were not statistically in explaining variations in the stock returns performance at the Nairobi Stock Exchange. This result, however is perfectly in line with the Stock Market Efficiency (SME) theory although it is violently in contrast to some of the previous studies on the



subject matter. Having this result, Stephen argued that when budget deficits reduce national saving the eventual impact is a reduction in investment or a reduction in net exports or both. They further state that budget deficits create a flow of assets abroad. Hence the country could be initially giving up local currency which then used by foreign exporters to procure bonds or stocks on the local market. Stephen (2014) concluded that a country can become a net exporter of assets if it persistently remained as a net importer of goods and services. Therefore, money supply is reduced as a result of reduction in national savings and this will further result in crowding out effect. This notion supports the Crowd Out Effect theory by Pilbeam and Keith (1993). Crowding out effect will make borrowing for investment by households expensive and eventually cause a reduction in investment on the stock market.

Pooja and Arun (2015) delivered a sound foundation for the strategic investigation of stock market performance variations caused by government deficits. The study was conducted in India and yearly time series data for the period 1988 to 2012 was utilised. The study made use of the Auto-Regressive Distributed Lag (ARDL) bounds test and a Vector Error Correction Model (VECM) for testing both the short-run and long run dynamic relationship, with stock prices as explained variable while budget deficit as one of the explanatory variables. The findings of the ARDL revealed a long run inverse relationship between stock prices and government budget deficit while no meaningful relationship was established for the short run. This short run outcome is in agreement with the Efficient Stock Market Hypothesis and Ricardian Equivalence which suggest that fiscal policy do not have any impact on stock market performance. More so, this study tallies with recent studies by Igbinedion *et al* (2013) and Stephen (2014) who also provided evidence on the inverse relationship between planned budget deficit and stock market returns. Below is the model employed by the study:

$$LBSE_t = \alpha_0 + \alpha_1 LDF_t + \alpha_2 LM3_t + \alpha_3 LCPI_t + \alpha_4 LRINT_t + \epsilon_t$$

LBSE represented Sensitivity index of Bombay Stock Exchange (Sensex), LFD = Fiscal Deficit as a percentage of GDP, LM3 = Money Supply (broad money), LCPI = Consumer Price Index, LRTNT = Real Interest Rate. All variables were taken in log form.

Furthermore, Gurloveleen and Bhatla (2015) came up with another study that provided another empirical results contrary to the common inverse or positive impact of budget deficit

on stock market performance. They investigated the effect of selected macroeconomic factor on stock market performance in India for a time span of 10 years from 2006 to 2015 using monthly time series data. The study applied Multiple Regression and Granger Causality Tests approach, with broad money, exchange rate, call money rate, crude oil price, gross budget deficit and inflation rate as explanatory variables while the BSE 500 index as the dependent variable. The findings revealed that these macroeconomic variables have no relationship with the stock market performance in India at the time of study. In appreciation of these results, we can conclude that the stock market of India has been in the semi-strong form according to the Efficient Market Hypothesis (EHM), this is so because all the regressors applied could not move the stock market in any way implying that the entire information about stock market is available in the market. This study is in agreement with the Stock Market Efficiency (SME) and also prior empirical findings in Kenya by Stephen (2014), thus according the study's findings we conclude that investors would not be able to gain any abnormal returns by using budget deficit historical information.

By employing monthly times series data over the period 2008 to 2014, Sirine and Jamel (2016) analysed the long-run and the short-run between demographic and macroeconomic variables and the Tunisian stock market. They adopted the ARDL model to establish the proposed relationships. Results of the study indicate that the Tunisian stock market, macroeconomic and demographic variables were cointegrated and, hence a long relationship existed. The long run coefficients suggest that inflation rate, number of unemployed graduates and budget deficits that were used as explanatory variables had negative effects on the Tunisian stock market. Therefore, it is vital to note that conclusions from Igbinedion *et al* (2013) and Pooja and Arun (2015) are consistent with findings by Sirine and Jamel (2016).

Emmanuel and Frank (2016), in a current research conducted study in Ghana provided evidence on the positive impact of the real budget deficits on real stock market returns. By employing inflation adjusted time series for the period January 2008 to December 2015, the study applied VAR framework, Granger Causality Tests and Impulse Response Functions (IRFs) to establish the above mentioned positive impact. The study revealed that government budget deficit Granger Cause stocks but stocks could not statistically Granger Cause budget deficit. Thus, in appreciation of these results Emmanuel and Frank (2016) proposed a reason to this positive impact. They postulated that the economy of Ghana was not fully employed and suggested that in order to sustain the economic the government of Ghana should continue

to implement policies that promote industrial stability by taking advantage of the recent bailout granted to it by IMF. Therefore, as the study is one of the fresh researches on the ongoing topic, the empirical conclusions strappingly cement various impact of the budget deficit in growing economies which lubricated motivation of a similar republic like Zimbabwe.

## **2.5 Summary**

The pragmatic and hypothetical literature reviewed laid down a comprehensive basis on the presence of positive and negative impact of planned budget deficit on stock market performance. Even though the chapter navigated through numerous researches that were done in several unindustrialised economies across the world as swotted in this chapter, it seems there no conclusive direct relationship that has been provided between the planned budget deficit and stock market returns in Zimbabwe. Hence, the above analysed empirical studies a model will be modified in order to close the gap that is in existence and conclusively presents solutions to the budget deficit management challenge in Zimbabwe. The following chapter is to stipulate the methodology then present a vibrant justification of variables.

## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The chapter presents the method used in the collection of information and gathering of data for the research. The chapter derives its guiding principle generally from the hypothetical and pragmatic studies established in the preceding chapter. Chapter 3 also seeks to discuss the research design, model specification, validation of variables and sources of the data for the research. There is also review of the model that is used to study the data together with the diagnostics test to be under taken and finally conclusion of the chapter.

### **3.2 Research Design**

Creswell (2012) defines research design as a plan of a research study that explicitly enables the researcher to effectively tackle the research problem as it provides a blue print for the collection, measurement and data analysis. The study seeks to bring to light the impact and planned budget deficits' direction of influence on stock market returns in Zimbabwe. More so, Trachim (2006) postulate that study design represents the ultimate strategy to be employed by the researcher in order to comprehensively and logically cement the robustness of the study.

### **3.3 Explanatory Research**

Explanatory research seeks to establish how variables come together, interact and the impact on each other. The study is explanatory in that its objective is to explore the effect of planned budget deficits on stock returns variations in Zimbabwe. More so, univariate data analysis was used since the only focus was on the influence of budget deficits.

### **3.4 Data Analysis Method**

As defined by (Cooper & Schindler, 2001) data analysis refers to the editing, sorting and applying statistical techniques to ascertain patterns and statistically relationships. The data was coded into a format that can be compatible into the analytical tool to facilitate analysis. E-views 13 package was used as an analytical tool for this research.

The researcher considered regression analysis as the most appropriate inferential statistic methods to determine the relationship between budget deficits and other variables in the model specified. Regression analysis is a statistical tool for investing relationships between variables and to ascertain the cause and effect as it also seeks to establish the extent to which variables affect each other. Hence, the procedure is the collection of data on the variables

under study and then employ the regression to estimate the statistical effect of the dependent variables and the dependent variables. The analytical tool shows statistical significance, degree of confidence which speaks the closeness of the relationship to the estimates and the direction of the relationship.

The model for the multiple regression analysis was established after the process of identifying the dependent variable, which is the variable to be predicted and the explanatory variables were also established. Therefore, the relationship was established and a number of diagnostic test were conduct and the results were presented in tables thereafter.

### **3.4.1 Data type**

The researcher used secondary data in this study. The data is a preferred source as it saves time and resources despite the fact that on the converse there is no control over how this data was collected by the bodies mentioned above for could be biased, however the researcher rely on the basis that the data published by reputable bodies.

### **3.4.2 Data Source**

The research statistical data sources were divided into two. Industrial index statistics were obtained from the Zimbabwe Stock Exchange while budget deficits, consumer price index and money supply statistics were obtained from the Reserve Bank of Zimbabwe under Economic Research Division.

### **3.5 Model specification**

The researcher uses the linear regression techniques and in particular the Ordinary Least Squares regression model to empirically detect the relationship between the budget deficit and the stock market return. Model to be employed was adapted from the study of Pooja and Arun (2014). The model was adapted from the following analytical framework:

$$LBSE_t = \alpha_0 + \alpha_1 LDF_t + \alpha_2 LM3_t + \alpha_3 LCPI_t + \alpha_4 LRINT_t + \epsilon_t$$

Where LSBE= Sensitivity index of Bombay Stock Exchange (Sensex), LFD = Fiscal Deficit as a percentage of GDP, LM3 = Money Supply (broad money), LCPI = Consumer Price Index, LRTNT = Real Interest Rate. Variables in this model were taken in natural logarithm form.

However, for the purposes of clarity in this current study, the variable LBSE is removed and replaced by the stock market returns (RM). The adaption is to be clearly explained in the

justification of variable segment. Pooja and Arun applied natural logarithms and, in this study, the researcher adopted natural logarithms since data on Budget deficits (DF) has bigger values and hence the use of logarithms will reduce these values so that the model will not produce spurious findings. Therefore, the model subjected to empirical findings from the adaption is as follows:

$$RM = \beta_0 + \beta_1 LBDF + \beta_2 CPIE + \beta_3 LM3 + \beta_4 LIR + \varepsilon_t$$

Where RM: Stock market returns (proxy; industrial index holding period returns assuming zero dividends)

DF: Planned Budget deficits (proxy; real budget deficits)

CPI: Consumer price index (proxy; actual changes)

M3: Money supply (proxy; broad money)

IR: Real interest rate (proxy; maximum lending rates)

$\varepsilon$  : Error term

$\beta_0$ - $\beta_4$  : Coefficients to be estimated

### 3.6 Justification of variable

The succeeding factors were considered and encompassed in the model as regressors: stock market returns, planned budget deficit, consumer price index, money supply and real interest rates. The variables shall be justified to present a robust basis for the presence of every variable in the econometric equation under study.

#### 3.6.1 Budget deficits (BD)

Planned budget deficits exerts an effect on stock market returns variations (Bradley, 2010). Government budget deficits' influences on stock market returns are cantered on national income mechanism which is a component of the public and private savings. In times of budget discrepancies public national servings becomes negative resulting in a negative market interest rate. This spectacle however constraints private investments by both companies and individuals on the bourse market. Any growth in budget deficit crowds out the private investors in the financial market as the government intervene through open market operations or on private placement basis. Furthermore, the Crowd Out Effect Theory is in support with this notion and states that government borrowing from the market drains the

much-needed capital. When this happens, domestic borrowing becomes expensive and companies' operations will be negatively affected. Thus, an inflationary environment might be created, forcing investors to lose confidence and this will reduce the demand and price for stocks as company performances continue to move southwardly. However, this is contrary to the Stock Market Efficiency which claims that stock market performance entirely and wholly replicates past physical policy actions and infers that there must be no any significant upshot of past budget deficits on existing stock market prices and performance. Nonetheless, riding on the Crowd Out Effect's motion Igbinedion *et al* (2013) and Pooja and Arun (2015) from their studies in Nigeria and India respectively revealed that government budget deficits negatively impact stock returns. Therefore, this study expects a negative sign.

### **3.6.2 Money supply (M3)**

The effects of monetary policy on stock prices movement remains debateable because a number of authorities still believe that positive influence in most cases overrides the inverse movement between money supply and stock returns. An expansionary monetary policy propagates economic growth and boost the cash in circulation resulting in an increase in the demand for equities and other attractive financial securities. This notion is promoted by the Monetarist Approach which claims that monetary authorities liquidate the economy through open market operations which will eventually push up the prices of debt instruments in the market and interest rate falls. Hence, when this happens the money market securities' return is lowered and consequently stock prices increase. More so, growth in money supply implies excess money in circulation for holding investment on the stock market as investors tend to store wealth on stocks and this in turn will result in an increase in both demand and returns for stocks. Keray (2009) study in Jamaica revealed that stock returns and money supply are positively related. His findings match with monetarists approach. The current study is expecting a positive sign.

### **3.6.3 Consumer Price Index (CPI)**

According to Fisher in the early 1990s, stocks in theory must be neutral to inflation and stock valuations should be inflation insensitive. Nominal interest rate in the market place is a summation of the predictable actual return and anticipated inflation rate. Interest rates are regarded less volatile and its fluctuations are derived mainly not from deviations in actual interest rate but market inflationary expectations. Since stocks returns are predominantly influenced by predictions and expectations in real variables by the market, an inverse relationship is derived from the negative relationship between inflation and the real variables

in the market. Stephen (2014) from his study in Kenya revealed an inverse nexus between inflation and stock returns. Hence, riding on these revelations, a negative sign is expected from this study.

### 3.6.4 Interest rate (IR)

Interest rate reflects the time value of money and the risk associated with stocks. Stowe *et al* postulated that investors require favourable interest rates that maximise their required rate of return using the Capital Asset Pricing Model Approach (CAPM). It is necessary that the market understands interest fluctuations because their variations influence the theoretical share value through the discounting factor. Thus, investors use the discounted rate to ascertain the return when valuing their investments on the capital market. More so, company operations are impacted by the interest rate, holding other factors constant an increase in market interest rates will raise the cost of borrowing for companies and hence companies have to employ turn around strategies in order for them to survive in such an environment. Empirical evidences from Keray (2009) and Emran (2009) studies in Jamaica and Turkey respectively displayed a negative relationship between interest rate and the stock market returns. Therefore, for this study basing on the presented findings and theoretical expectations the expected sign is negative.

**Table 3.1: Independent Variables and Expected Signs**

Variable	Expected Sign
Budget Deficit (BD)	-
Money Supply (M3)	+
Consumer Price Index (CPIE)	-
Interest rate (IR)	-

*Source: author's expectations*

### 3.7 Regression coefficient

It takes the value of the explanatory variable and it shows the significance, direction and the magnitude of the nexus between the stock returns being the dependent variable and budget deficits, money supply and consumer price index being the independent variables. Thus, for a negative relationship the corresponding regression coefficient is also negative and a positive relationship will also have a positive coefficient. Therefore, for a weaker relationship the coefficient takes a value of zero and it is regarded as statistically insignificant.



### **3.7.1 Diagnostic Tests**

The analytical tests are done to test for relevance and applicability before the approximates and estimations are used for forecasting purposes. The diagnostic test shall be done to test on the following, Heteroskedasticity, Multicollinearity, Autocorrelation and Granger causality.

### **3.7.2 Unit root test**

Gujarati and Porter (2009) postulate that times series data sets are considered stationary when their statistical chattels are constant over time. This depicts a situation where by the mean, variance and autocorrelation structure take constant position over time. In any case in order to analyse the data set especially when employing time series, the data should be stationary and if not, some form of transformation is needed to bring the data set to some form of stationarity. Therefore, all statistical parameters must be independent of time for a robust data analysis. A number of tests can be applied when determining stationarity level, namely Dicky Fuller Test (DF), Phillips Peron Test (PP) and the commonly used Augmnted Dicky Fuller Test (ADF) and the current research employed the ADF and the hypothesis will be as below:

Ho: The time series has a unit root.

Decision: If at 5% level of significance the ADF static < ADF critic do not reject Ho and conclude that the unit root is absent.

### **3.7.3 Cointegration Test**

According to Gujarati and Porter (2009), cointegration shows the long run relationship among the variables explaining the model. Thus, cointegration is necessary if the variables are not stationary at the same level or the relationship established between the variables is not true. To test for this long-term relationship in this study, the study employed the Johansen cointegration test and the hypothesis test is as below:

H<sub>0</sub>: Cointegration is not present

Decision: We do not reject Ho If t-static is greater than t-critic and conclusively say that cointegration is present.

### **3.7.4 Autocorrelation**

This is a situation where there is correlation between series of observations in time. Therefore, the test is done to check for randomness in a data set. In regression, the classical linear regression assumes absence of autocorrelation in the disturbance and also claims that observations are not affected by error terms relating to that data. Breusch-Godfrey serial correlation LM test was employed in this study and it denotes the following hypothesis:

H<sub>0</sub>: Autocorrelation is does not exists

We consider rejection of the null hypothesis provided the probability value of the Bruesch-Godfrey Serial Correlation LM Test is less than 0.05 while and at 5% level of significance.

### **3.7.5 Heteroscedasticity**

This a systematic movement of the error term in which the variances of the errors do not take a constant position (Gujarati, 2003). Hence, the Ordinary Least Squares assume that all observations are equally reliable, that is to say they have constant variance. However, the unbiasedness and uniformity of the Ordinary Least Squares estimators are not compromised by the presence of heteroscedasticity. Therefore, inability to deal with heteroscedasticity will result in the study drawing misleading inferences. The research will use the Breusch-Pagan Test for testing heteroscedasticity which concludes the following hypothesis:

H<sub>0</sub>: The model has homoscedasticity (variables have constant variance)

We do not consider rejection of the null hypothesis provided that the probability value of the Breusch Pagan Godfrey Test is above 0.05.

### **3.7.6 Multicollinearity**

Gujarati (2004) defined multicollinearity as the presence of massive perfect linear combinations among a portion or all regressors in the model. Thus, regressors in a multiple regression analysis should have a linear combination. Hence, the existence of multicollinearity indicates that the coefficients are unstable. Multicollinearity might exist as being perfect or near linear combinations between the regressors and this will disturb regression results because explanatory variables are actually dependent on each other in explaining the model. Multicollinearity is a problem of all data and existence in some explanatory variables is considered severe if the pairwise correlation is more than 0.8 and this condition might result in such variables being dropped from the model. This study is to use autocorrelation matrix to detect multicollinearity.

H<sub>0</sub>: Multicollinearity is not severe.

Decision: We consider rejection of the null hypothesis given that the correlation is greater than 0.8.

### **3.7.7 Model Specification Test**

Gujarati and Porter (2009) postulated that model specification biasness is experienced if the model is not correctly specified and this result in violation of the assumptions of linear regression model which emphasizes on the claim that each regression model employed in regression must be specified correctly. Hence, riding on the same notion employing the Ramsey RESET Test to detect if the model is specified correctly and this will enhance proper investigation on the impact of planned budget deficit on stock market performance. The succeeding hypothesis was employed:

Ho: The model is correctly specified.

Decision: We consider rejection of the null hypothesis if the probability value of the Ramsey RESET Test is less 0.05 at 5% level of significance.

### **3.7.8 Normality**

Gujarati (2004) suggests that statistically normality tests are done to detect if the data sets are correctly modelled in a normal distribution criterion. The assumption which validates a normal distribution to the error term instead of the explanatory variables is often considered by means of the Jacque-Bera Test of normality and this study will employ the same test with the following hypothesis:

Ho: There is presence of normally.

Decision: The null hypothesis is not rejected given that the Jacque-Bera Test's probability value of is greater than 0.05, the kurtosis value standing close to the value of 3 and a value of the mean value should be equal or close to 0 at the 5% level of significance.

### **3.8 Summary**

The chapter explored on the model adapted and the adjustments thereof to suit the Zimbabwean scenario. Methods of estimation, data sources and its characteristics were outlined in this chapter. More so, the variables in the model were justified highlighting the basis on the make up to the presentation and interpretation the of findings. Therefore, the following chapter will look at data presentation and analysis and give a more detailed discussion on the diagnostic tests that were briefly discussed in this chapter.

## CHAPTER 4: DATA PRESENTATION AND ANALYSIS

### 4.1 Introduction

The chapter reports empirical results attained during the study according to the methodology, guided by the literature review outlined in chapter two. Interpretation of results obtained from the chapter were benchmarked against the research questions and objectives presented in chapter one. Study hypothesis testing and necessary diagnostic tests will be carried out and finally a summary of results from the tests will be given at the end of the chapter.

### 4.2 Results of Diagnostic Tests

In estimating the OLS model the study conducted a number of procedural tests namely stationarity, cointegration, autocorrelation, heteroscedasticity, multicollinearity, normality and model specification and findings were established.

#### 4.2.1 Stationarity Test Results

Before estimating the model, the researcher performed the unit root tests to detect the presence of a unit root, hence Augmented Dicky Fuller (ADF) and was employed in order to ignore any spurious regression. The outcomes of the test are presented in the table 4.1 underneath:

**Table 4.1: Stationarity Test Results.**

Variable	ADF Statistics	Critical values	Order of Integration
RM	-9.477802	1% -3.500669	I (0)
		5% -2.892200	
		10% -2.583192	
BD	-6.858363	1% -3.500669	I (0)
		5% -2.892200	
		10% -2.583192	
CPIE	-6.967700	1% -3.501445	I (1)
		5% -2.892536	
		10% -2.583371	
M3	-5.082691	1% -3.500669	I (0)
		5% -2.892200	
		10% -2.583192	
		1% -3.500669	

IR	-3.065525	5%	-2.892200	I (0)
		10%	-2.583192	

*Check Appendix 2.1 for detailed results*

The (ADF) stationarity tests show that all other variables became stationary at their first difference I (0), except CPIE, which shows absence of a unit at root at first difference I (1). Therefore, we reject the null hypothesis and conclude that the data is stationary at the above respective levels and consider a robust model estimation to progress.

Previous researches done on relevant topics present that most macroeconomic variables tend to be non-stationary at level while stationary at their first difference I (1) because economies evolve and grow over time and it is common knowledge that economic and financial series reveal the invalidity of the assumption of having a constant mean and variance over time. Having a stationary time series would be an exception. Thus, the results of this test are in line with prior findings.

#### **4.2.2 Johansen Cointegration Test Results.**

Since it is considered desirable to have a long run relationship between each pair of variables in the model under study, the study employed the Johansen Cointegration Test to establish the long-term relationship and eliminate every possibility of having a spurious regression. Hence, the results are shown in table 4.3 below:

**Table 4.2 Johansen Cointegration Test Results.**

Hypothesized No of CE(s)	Eigen value	Trace statistic	Critical value 0.05	Probability**
None*	0.234150	78.02135	69.81889	0.0096
At most 1*	0.210876	53.21189	47.85613	0.0144
At most 2*	0.187909	31.18648	29.79707	0.0344
At most 3	0.076206	11.82923	15.49471	0.1653
At most 4*	0.046799	4.457485	3.841466	0.0347

*\*denotes number of cointegration equations at the 0.05 level. See Appendix 4.2 for full results.*

The above table shows a summary of the expected, theoretical and observed empirical results. First, we check the Unrestricted Cointegration Rank Test (Trace) particularly Trace Statistic

Value, Probability value and the Critical value at 5%. If the Trace Statistic is greater than the Critical Value at 5%, it means that the variables (BD, IR, M3 CPIE and RM) have long term relationship or that they are related in the long term. In addition, we also check on the probability which must be less than 5% level ( $p > 0.05$ ).

Evidenced by the rejection of the null hypothesis by the Trace test which shows 3 cointegration equations which are at 0.05 level and the Trace Statistic has a value 78.02135 which is greater than the Critical Value standing at 69.81889 and the probability value for Trace Test stands at 0.0005 ( $p = 0.0096$ ), we conclude that variables have a long-term relationship or that they move together in the future. Evidenced by the probability value which is less than 5%, In summary, the variables display a long-term association.

### 4.2.3 Autocorrelation Test Results

To test the relationship between the error terms, the Bruesh Godfrey Serial Correlation Test was employed. The outcomes are displayed in table 4.1.3

**Table 4.3 Autocorrelation Test Results**

F-Statistic	Prob.F(2,25)	Observed* R-Squared	Prob.Chi-Square (3)
2.167482	0.0975	6.605488	0.0856

*Check Appendix 2.3 for detailed results*

The LM test probability value is greater than 0.05, therefore the null hypothesis should not be rejected and make a conclusion that serial correlation is absent.

### 4.2.4 Heteroscedasticity Test Results

Current study employed the Bruesch-Pagan Godfrey Test to determine the existence of heteroscedasticity and the findings are shown in table 4.4.

**Table 4.4: Bruesch-Pagan Godfrey Test Results**

F-Statistic	1.87245	Prob.F(4,91)	0.2446
Obs*R-squared	5.517428	Prob. Chi-Square (4)	0.2382
Scaled explained	14.67097	Prob. Chi-Square (4)	0.0054

*Check appendix 2.4 for detailed results*

Evidenced by the Bruesch-Pagan Test results showing a probability value of 0.2446, we conclude that at 5% level of significance there is no heteroscedasticity since the probability value is above 0.05.

#### 4.2.5 Multicollinearity Test Results

Multicollinearity test is done to check if one predictor variable can be linearly predicted from other regressors in the model with a substantial level of accuracy. A correlation value less than 0.8 indicates the absence of multicollinearity problem. Table 4.5 shows correlations of the variables.

**Table 4.5 Multicollinearity Test Results**

	BD	M3	IR	CPIE
BD	1.000000			
M3	-0.056617	1.000000		
IR	0.001997	-0.112109	1.000000	
CPIE	-0.333652	0.115035	-0.342475	1.000000

*Check Appendix 2.5 for detailed results*

From the table 4.5, 0.342475 shows a highest pairwise correlation for IR and CPIE, but however it is below 0.8 and this explicitly implies that all the regressors are free from the multicollinearity problem. Hence, the study does not reject the null hypothesis and claim that that the model under study is free from severe multicollinearity.

#### 4.2.6 Model Specification Test results

The researcher used the Ramsey RESET TEST to test for model specification errors. Model that is specified correctly will present a vibrant investigation of the impact postured by budget deficits on stock market returns and hence makes the Model Specification Test vital in diagnosing tests for the current study. Table 4.7 below shows the outcomes.

**Table 4.6 Ramsey RESET TEST Results**

F-Statistic	Probability	D.Waston	R <sup>2</sup>	Adjusted R <sup>2</sup>
0.029915	0.8631	1.518732	0.578591	0.555180

*Check Appendix 2.6 for detailed results*

from the above results, a Ramsey RESET TEST probability value of 0.8631 backs the decision is that the null hypothesis should not be rejected since the probability value is way

above 0.05. Moreover, D W Statistic value 1.518732 and is bigger than adjusted  $R^2$  and  $R^2$ . Therefore, we terminate the possibility of spurious regression.

#### 4.2.7 Normality Test Results

Jarque Bera Normality Test was employed to detect the normality of the model and respective findings are given in table 4.17.

**Table 4.7 Normality Test Results**

Mean	Skewness	Kurtosis	Jarque-Bera Statistic	Probability	Standard Dev
2.92e-14	-0.7548577	6.918503	70.52887	0.0000	4.235036

*Check appendix 2.7 for detailed results*

From table 4.1.7 outcomes the Jarque Bera Normality Test probability value is less than 0.05, basing on Jarque Bera Normality Test is not acceptable suggesting that we reject the null hypothesis. However, Rose *et al* (2015) delivered an explanation to the challenge. Whenever the probability value goes below 0.05 a modest rule of thumb should be used before the null hypothesis is rejected. Rose *et al* indicated that given that the finding obtained from dividing the kurtosis value by the standard deviation is within the range of plus or minus 1.96 it advises that the variation from the normality is not very far. Backed by their intuition, in this study this rule of thumb gives 1.63363 and it fits inside the range 1.96, indicating that the variation from the normality is insignificant. Moreover, the model's skewness value stands at -0.7548577 and this implies that the model is negatively skewed. The kurtosis value is greater than 3, and this is considered to be a too high peakedness of the dispersion. Nevertheless, numerous intellectuals postulate that excess kurtosis might emanate from outliers and yet the model will be normally distributed. Therefore, basing on these intuitions the study will not reject the null hypothesis and conclude that residuals are distributed normally.

#### 4.3 Presentation of Regression Results

Having done with the diagnostic tests the study employed Ordinary Least Squares technique to estimate the model for the phenomenon under study. The table 4.8 below shows the regression results established and all the independent variables are discussed in their respective relation to the dependent variable. Therefore, the procedure below is done to test the study's hypothesis.



1. The study's null hypothesis claims that there is no significant relationship between planned budget deficits and the regressors, while alternative hypothesis claims that there is a significant relationship between planned budget deficits and regressors.
2. Absolute value of the T-statistic must be greater 2.
3. Decision rule commands that we do not reject the null hypothesis given that we reject.

**Table 4.8 Summary of Regression Results**

Variable	Coefficient	Std Error	t-statistic	probability
Constant	-230.4032	58.33484	-3.949667	0.0002
BD	0.885793	0.079838	11.09491	0.0000
M3	0.405882	0.257933	1.573596	0.1191
CPIE	46.44257	12.61848	3.680521	0.0004
IR	0.404221	0.212741	1.900999	0.0605

*Check Appendix 3 for detailed results*

$$R^2 = 0.578451$$

$$\text{Adjusted } R^2 = 0.559922$$

$$D. W = 1.502194$$

$$F. \text{ Statistic} = 31.21765$$

$$\text{Prob (F-Statistic)} = 0.0000$$

The projected equation in table 4.8 can be presented formulary as below:

$$RM = 0.885793BD + 46.44257CPIE + 0.405882M3 + 0.404421IR \dots \dots \dots 4.1$$

In equation 4.1 RM; is representing stock market returns, BD budget deficit, CPIE; consumer price index, M3; money supply, IR; real interest rates.

The study expected variables explaining the model to be statistically significant in influencing stock market returns despite the fact that the findings presents some variables namely M3 being statistically not significant and IR is significant at the 10% level, however BD is the major variable in explaining the variations in stock returns at the ZSE that the study is focusing on. Hence, except for M3 and IR all other variables included in the model have p-

values which are less than 0.05. The implication is that stock market returns performance is influenced more by budget deficit and consumer price index changes, even though variable's signs not conformed to expectations.

The explanatory variables in the model explain 57.8 % of changes in stock returns evidenced by the  $R^2$ , and the other 42% being explained by other factors not included in the model. Therefore, research model determines at most 55.99% oscillations in stock returns having taken into account degrees of freedom and thus other factors explain the remaining 44.01%. The F-Statistic stands at 31.21765 cements firmly on the viability of the model and more so backed by the Durbin Watson statistic that stands at 1.502194 and its adjacent to 2, hence the likelihood of serial correlation is dismissed. Therefore, basing on the above results we consider the model worth to form the basis for policy formulation.

#### 4.4 Hypothesis Testing and Discussion of Regression Results

It is necessary that the study makes a comparison of the empirical and the expected signs in order to prove whether planned budget deficit changes and all publicly available fiscal information presents empirical evidence for the available expected and observed signs.

**Table 4.9 Expected and Hypothesized Signs of Regressor Variables.**

Explanatory Variable	Hypothesized signs	Observed sign
Budget Deficit (BD)	-	+
Consumer Price Index (CPIE)	-	+
Interest Rate (IR)	-	+
Money Supply (M3)	+	+

*Source: author's presentation.*

The above table displays a summary of both the expected and the established signs of the regressors. A positive nexus between stock market returns and the regressors and is denoted by the sign (+) and an inverse relationship is represented by the sign (-). The sign (?) shows that there is an estimation is not clear of the theoretical signs.

#### **4.4.1 Stock Market Returns with Budget Deficit**

Budget deficit's beta coefficient rejected the null hypothesis and do not reject the alternative hypothesis implying that there is a significant relationship between government budget deficits and the stock returns. Earlier to the estimation on the model negative relationship was expected between planned budget deficits and stock market returns. However, current study established a positive relationship between the two variables. This result implies that planned budget deficits are considered statistically significant in stock market variations. The BD's p-value of 0.0000 is less than 0.05. The study's modulus of the t-statistic stands at 11.09491 and this is way greater than 2 in absolute terms to demonstrate significance. In addition, BD's coefficient is 0.885793 implying that a dollar increase in the budget deficit will result in a 0.886 dollar increase in stock returns, *ceteris paribus*. This positive impact found by the study can be explained by high expenditure on developmental projects by government and income generating projects that the authorities are financing for business develop in both the public and private sector. More so, these positive market developments tend to attract investors on the local bourse amid that companies' performance improve significantly hence high demand for stocks which in turn will shift stocks prices upwards and eventually investors are to attain high returns. The detected sign for budget deficit contradicts with the Crowd Out Effect Theory which is of the notion that budget deficits crowd out the private sector of the much-needed capital that the companies would have acquired to finance their operations. This may cause poor company performance and hence poor performance by the stock market and finally returns are likely to fall. In addition, the sign also opposes the Stock Market Efficiency which states that fiscal policies do not have any significant effect on the stock market performance because it takes all the publicly available information and riding on this theory's intuition budget deficits are not expected to pose an impact on stock market.

Nonetheless, the positive impact of budget deficit on stock returns is also justified on the basis of findings by other studies. In Pakistan, a long run positive relationship exists between budget deficits and stock market performance as evidenced by Faiza *et al* (2012) from their empirical study on budget deficits and stock prices for the period 1988 to 2012. More so, Osamwanyi and Osagie (2012) found a positive relationship between budget deficits and stock market performance on the Nigerian Stock Exchange. Furthermore, Ifuero and Ester (2012) also found positive relationship between budget deficits and stock market returns for Nigeria during the period 1975 to 2005. Therefore, Zimbabwe standing as an unindustrialised

economy cannot be excluded, implying that conclusions from this study in some way might replicate factual impact of budget deficits on stock returns in Zimbabwe.

#### **4.4.2 Stock Market Returns with Consumer Price Index**

A positive coefficient for consumer price index was established and it is statically significant at 5% and in that regard, we reject the null hypothesis which claims that there is no relationship between consumer price index and stock market returns. The positive impact established between stock returns and consumer price index as an inflation indicator can be explained on the basis that investors may consider the stock market as a safe haven and also as a way of storing and shielding their investment purchasing power as they stand to hedge against increase in prices. findings indicate that a rise in consumer price index results in an inflationary effect in the economy. More so, findings from other study, Ifuero and Ester (2012) in Nigeria indicated a positive nexus between inflation and stock market returns. However, Monetarists in their theory claims that stock prices are inflation insensitive and remains neutral because interest rates used by companies to discount their cashflows do not go up when inflation go up. This view is also cemented by Fama and Schwert (1977) sentiment in that the believe that common stocks are a safe haven in times of inflation must be eliminated. This is so because most empirical results indicate an inverse relationship.

#### **4.4 Summary**

The chapter offered a comprehensive set of pragmatic results of the study and performed all necessary diagnostic tests to ensure that dependability of the regression results is not compromised. More so, the chapter provided an interpretation of the findings. Planned budget deficit was the variable of major concern and it proved to be an important factor in explaining stock market returns variations although the result is conflicting with prospects of the investigator. Chapter 5 shall summarise the study, give possible policy recommendations and suggestions for future academic research backed by the findings established in the current chapter.

## **CHAPTER: 5 SUMMARY, CONCLUSIONS AND POLICY**

### **RECOMMENDATIONS**

#### **5.1 Introduction**

The chapter presents closing clarifications of the study derived from an assessment of the objectives formerly emphasized in chapter 1. Riding on these clarified objectives chapter 5 further delivers a resolution to the problem that inspired the research by offering possible strategies and sound economic policy recommendations. More so, the chapter stands to give suggestions and the drive on potential further studies that relays to the case under study.

#### **5.2 Summary of the Study**

The study was motivated by the need to find out the possible impact of planned budget deficits on stock market returns in Zimbabwe for the period 2009 to 2016. Massive budget deficits, low and poor participation by both corporates and individuals on the local stock exchange accompanied by decreasing stock market returns that Zimbabwe is currently experiencing were the main driving forces behind this motivation. Chapter 1 offered an introspective evaluation of the partial relationship between planned budget deficits and stock market returns over the years. In chapter two, the research critically reviewed literature to assist in building a foundation for this study and it also provided a summary of the relationship between the variables of concern in numerous nations across the globe. More so, chapter 3 explicitly specified the model deriving its basis from the empirical literature reviewed in chapter two. In chapter 4, findings and respective diagnostics tests were presented in attempt to ensure that reliability of the model estimation results is not compromised. Therefore, evidenced by the results of the study, the research revealed that planned budget deficit positively impact stock market returns while consumer price index also revealed to be statistically significant in explaining variations in stock market returns.

#### **5.3 Conclusions**

The fundamental objective of this study was to analyse the potential impact of the planned budget deficit on the stock market returns performance in Zimbabwe. Hence, backed by the results debated and revealed in the previous chapter the study can draw the following conclusions:

- The study confirmed a positive impact of the planned budget deficit on stock market returns in Zimbabwe evidenced by a positive sign in table 4.9 and this conclusion is

further justified by the rejection of the null hypothesis mentioned in chapter one; Planned budget deficit has no impact on stock market returns performance in Zimbabwe.

- Changes in planned budget deficits cause changes in stock market returns in Zimbabwe. However, contrary to Crowd Out Effect Theory's expected sign, an increase in government budget deficit will result in positive increase in stock market returns.
- Inferences drawn by the study about market efficiency with respect to government budgets and other policy actions is that the local market do not take all publicly available information about fiscal deficits in Zimbabwe, thus the changes in government budget deficit effected changes in stock market returns. Thus, this notion opposes the Efficiency Market Hypothesis (EMH).

#### **5.4 Policy recommendations**

Riding on the major findings revealed in this study recommendations for various stakeholders in making decisions, policies and investments can be presented as below:

##### **5.4.1 Government and ZIMRA Must Engage in Activities that Improves Its liquidity Position**

As evidenced by the dominance of the informal sector in the economy of Zimbabwe, earnings are spent in the shadow economy. It is of paramount importance now that the government engage in activities that improves its liquidity position through encouraging ZIMRA to foster tax compliance in the informal sector as this move will increase government's liquidity position and hence reduction in planned budget deficits.

##### **5.4.2 Government and Ministry of Finance Should together curb Unnecessary Expenditures by the Government**

The government should also improve the provision of government services and infrastructure and work towards reducing unnecessary costs with the aim to reduce its excess borrowing from the private sector. This will allow the corporates to access more liquidity at cheaper rate and improve their financial performance which will further positively impact the local stock market's performance.

#### **5.4 Suggestions for future study**

It is imperative to understand that there was an exclusion of other important factors that also explain variations in stock returns such as market risk, exchange rate and net foreign share

purchases due to reasons beyond the author's discretion. The model has its particular limitations thus presenting a gap for other studies in investigating possible effect of these factors on local stock market's performance.

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## APPENDICES

### APPENDIX A: DATA SET

Month	RM	BD	CPIE	M3	IR
2009:01:00	10.13965	17.62044	4.553502	15.44929	8.26
2009:02	-3.92259	13.73048	4.521258	13.14258	8.59
2009:03	-8.00315	11.4785	4.490123	13.12209	8.63
2009:04	14.26192	18.74067	4.479158	15.38881	8.68
2009:05	-5.88903	9.057414	4.470298	15.34658	8.66
2009:06	0.294808	11.97072	4.475845	15.30914	8.5
2009:07	1.671903	12.63375	4.485751	15.27905	8.59
2009:08	2.936907	13.99006	4.490123	15.2511	8.66
2009:09	-10.8902	8.37892	4.484655	15.24471	8.58
2009:10	1.414751	12.23194	4.492954	17.52971	8.19
2009:11	-2.38834	10.0197	4.492223	17.50689	7.84
2009:12	-7.16375	9.521192	4.496997	15.25673	8.07
2010:01	-1.51058	13.88083	4.504415	15.20745	8.23
2010:02	2.678386	15.44297	4.513831	15.17988	8.02
2010:03	0	15.19504	4.525477	15.04873	7.6
2010:04	4.56864	16.96414	4.526529	14.04413	7.02
2010:05	14.0485	21.12901	4.52863	14.06822	7.01
2010:06	-1.99168	12.72374	4.52758	13.9459	6.6
2010:07	-2.17748	11.28534	4.526529	13.94019	5.89
2010:08	6.295897	18.8778	4.525477	11.71587	5.96
2010:09	-1.28695	10.15761	4.526529	12.42658	6.45
2010:10	1.007234	12.19504	4.52863	11.83495	6.83
2010:11	2.465466	13.94077	4.532819	11.88295	6.41
2010:12	-0.78652	11.68228	4.52884	17.22769	5.73
2011:01	2.305351	13.24968	4.539069	10.44387	6
2011:02	-2.10967	9.164365	4.544248	13.96639	6.22
2011:03	-1.94936	11.29553	4.55135	14.17476	6.32
2011:04	-2.97793	12.32439	4.552785	11.05045	6.65
2011:05	-8.18091	8.833065	4.553604	11.2917	6.77
2011:06	0.970343	14.84933	4.556058	9.806376	6.53
2011:07	0.605146	14.61081	4.558607	11.11387	6.52
2011:08	-5.16325	8.009915	4.559625	10.72404	7.3
2011:09	5.279736	17.15688	4.568739	11.24965	7.35
2011:10	-6.55845	9.677451	4.569746	10.08242	7.55
2011:11	-5.41607	9.94537	4.574769	10.47351	7.52
2011:12	1.896226	14.05741	4.576771	9.377997	6.87
2012:01	-0.05303	13.76543	4.580877	15.02286	6.95

2012:02	0.72486	14.26715	4.585904	17.22443	7.28
2012:03	-0.49022	14.00033	4.59018	14.91447	6.9
2012:04	9.876133	19.84889	4.592077	14.91916	7.35
2012:05	5.639328	16.66811	4.592764	17.25798	7.76
2012:06	-2.82985	10.8242	4.594773	14.94823	7.73
2012:07	1.480725	12.18609	4.597048	14.94926	8.03
2012:08	16.27748	24.05673	4.595282	14.9825	8.02
2012:09	1.823356	3.975027	4.599909	15.036	7.69
2012:10	0.676637	0.241325	4.602524	15.01577	7.55
2012:11	3.094962	4.854921	4.603862	14.96427	7.52
2012:12	11.31441	13.01316	4.60517	15.01681	6.87
2013:1	-0.56189	0.183753	4.60582	14.98621	8.46
2013:2	9.772216	11.82458	4.615284	14.99339	7.56
2013:3	-24.8289	2.250471	4.61736	15.00094	7.31
2013:4	9.637548	19.02721	4.616632	15.05108	7.34
2013:5	4.730133	11.84178	4.614572	15.02233	7.45
2013:6	1.96867	7.942528	4.613256	15.00135	7.33
2013:7	-5.66938	0.266017	4.609438	15.02844	7.24
2013:8	-6.57927	0.060873	4.607962	14.99845	7.25
2013:9	0.105625	7.754495	4.608494	15.03005	7.29
2013:10	-7.18246	0.378499	4.608359	15.02165	7.26
2013:11	-1.95293	10.58573	4.609285	14.99201	7.22
2013:12	1.138598	3.996236	4.60848	15.08573	6.82
2014:1	6.46493	10.07024	4.609928	14.99544	6.56
2014:2	0.80609	2.704654	4.61042	14.99864	6.21
2014:3	4.343873	7.809891	4.608057	15.04137	5.98
2014:4	-0.60253	1.880155	4.613998	15.07766	5.17
2014:5	-9.31716	0.591084	4.612679	15.10478	4.21
2014:6	-3.68175	7.185991	4.612426	17.39831	2.98
2014:7	-5.18307	4.973056	4.612566	15.01896	1.6
2014:8	1.28782	12.74392	4.609475	15.06103	1.83

2014:9	1.361221	13.31497	4.609422	15.0785	2.04
2014:10	-5.4965	5.364344	4.608365	15.09472	2.12
2014:11	-1.24652	10.43153	4.601363	15.07292	2.21
2014:12	-2.13448	8.545972	4.600459	15.08582	2.82
2015:1	-3.02651	7.658618	4.597051	15.03967	2.46
2015:2	-2.07667	8.182127	4.596356	15.02036	2.59
2015:3	-7.06897	2.471521	4.596078	15.0632	2.77
2015:4	-2.61834	7.756076	4.58716	12.77224	3.26
2015:5	-0.83727	10.4286	4.585287	17.38668	5.35
2015:6	-10.7035	1.578607	4.583897	15.11835	8.95
2015:7	-2.32368	10.58872	4.584464	12.74715	8.99
2015:8	-10.851	3.852294	4.581409	15.06147	9.23
2015:9	-3.49596	11.85229	4.577809	15.09	7.23
2015:10	-1.91777	14.51964	4.574918	17.4406	6.32
2015:11	8.047605	21.70754	4.576522	15.14066	5.21
2015:12	-1.03569	10.39019	4.575449	15.17114	3.12
2016:01	-3.55826	7.058598	4.574942	15.17113	1.58
2016:02	-2.20141	9.471521	4.57391	15.16647	1.57
2016:03	0.424029	11.74228	4.572736	15.16841	1.59
2016:04	-0.30269	11.24374	4.570587	15.25063	2.11
2016:05	19.95861	36.62777	4.568207	15.24023	2.87
2016:06	12.62629	17.58573	4.570141	15.33513	2.03
2016:07	5.29224	17.62044	4.568285	15.33548	9.71
2016:08	-3.01319	16.84889	4.567053	15.23992	2.27
2016:09	-3.57868	16.85492	4.564452	15.17629	2.75
2016:10	2.661768	16.583	4.56535	15.18271	3.95
2016:11	3.005613	16.85229	4.565521	15.33513	5.06
2016:12	12.54506	17.28664	4.566091	15.3764	8.04

## APPENDIX B: REGRESSION RESULTS

Dependent Variable: RM  
 Method: Least Squares  
 Date: 04/16/18 Time: 19:54  
 Sample: 1 96  
 Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-230.4032	58.33484	-3.949667	0.0002
BD	0.885793	0.079838	11.09491	0.0000
M3	0.405882	0.257933	1.573596	0.1191
CPIE	46.44257	12.61848	3.680521	0.0004
IR	0.404421	0.212741	1.900999	0.0605
R-squared	0.578451	Mean dependent var		0.157722
Adjusted R-squared	0.559922	S.D. dependent var		6.522787
S.E. of regression	4.327113	Akaike info criterion		5.818356
Sum squared resid	1703.876	Schwarz criterion		5.951916
Log likelihood	-274.2811	Hannan-Quinn criter.		5.872343
F-statistic	31.21765	Durbin-Watson stat		1.502194
Prob(F-statistic)	0.000000			

## APPENDIX C: UNIT ROOT TESTS RESULTS

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-9.477802	0.0000
Test critical values:		
1% level	-3.500669	
5% level	-2.892200	
10% level	-2.583192	

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

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(RM)  
 Method: Least Squares  
 Date: 04/16/18 Time: 20:03  
 Sample (adjusted): 2 96  
 Included observations: 95 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RM(-1)	-0.989600	0.104412	-9.477802	0.0000
C	0.052365	0.667874	0.078405	0.9377
R-squared	0.491327	Mean dependent var		0.025320
Adjusted R-squared	0.485858	S.D. dependent var		9.078432
S.E. of regression	6.509574	Akaike info criterion		6.605253
Sum squared resid	3940.833	Schwarz criterion		6.659019
Log likelihood	-311.7495	Hannan-Quinn criter.		6.626978
F-statistic	89.82874	Durbin-Watson stat		1.936521
Prob(F-statistic)	0.000000			

## BD UNIT ROOT TEST RESULTS

Null Hypothesis: BD has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.858363	0.0000
Test critical values:		
1% level	-3.500669	
5% level	-2.892200	
10% level	-2.583192	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(BD)

Method: Least Squares

Date: 04/16/18 Time: 20:23

Sample (adjusted): 2 96

Included observations: 95 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BD(-1)	-0.671154	0.097859	-6.858363	0.0000
C	7.519957	1.240413	6.062462	0.0000
R-squared	0.335890	Mean dependent var		-0.003514
Adjusted R-squared	0.328750	S.D. dependent var		6.888320
S.E. of regression	5.643592	Akaike info criterion		6.319747
Sum squared resid	2962.062	Schwarz criterion		6.373512
Log likelihood	-298.1880	Hannan-Quinn criter.		6.341472
F-statistic	47.03714	Durbin-Watson stat		2.178166
Prob(F-statistic)	0.000000			

## CPIE UNIT ROOT TEST RESULTS

Null Hypothesis: D(CPIE) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.967700	0.0000
Test critical values:		
1% level	-3.501445	
5% level	-2.892536	
10% level	-2.583371	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CPIE,2)

Method: Least Squares

Date: 04/16/18 Time: 20:48

Sample (adjusted): 3 96

Included observations: 94 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CPIE(-1))	-0.479416	0.068805	-6.967700	0.0000
C	0.000410	0.000426	0.962314	0.3384
R-squared	0.345423	Mean dependent var		0.000349
Adjusted R-squared	0.338308	S.D. dependent var		0.005082
S.E. of regression	0.004134	Akaike info criterion		-8.118198
Sum squared resid	0.001572	Schwarz criterion		-8.064086
Log likelihood	383.5553	Hannan-Quinn criter.		-8.096341
F-statistic	48.54884	Durbin-Watson stat		2.502132
Prob(F-statistic)	0.000000			

## M3 UNIT ROOT TEST RESULTS

Null Hypothesis: M3 has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.082691	0.0000
Test critical values:		
1% level	-3.500669	
5% level	-2.892200	
10% level	-2.583192	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(M3)

Method: Least Squares

Date: 04/16/18 Time: 20:58

Sample (adjusted): 2 96

Included observations: 95 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M3(-1)	-0.434563	0.085499	-5.082691	0.0000
C	6.312970	1.251046	5.046155	0.0000
R-squared	0.217394	Mean dependent var		-0.000767
Adjusted R-squared	0.208979	S.D. dependent var		1.627140
S.E. of regression	1.447168	Akaike info criterion		3.597922
Sum squared resid	194.7695	Schwarz criterion		3.651688
Log likelihood	-168.9013	Hannan-Quinn criter.		3.619647
F-statistic	25.83375	Durbin-Watson stat		2.258876
Prob(F-statistic)	0.000002			

## IR UNIT ROOT



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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.065525	0.0326
Test critical values:		
1% level	-3.500669	
5% level	-2.892200	
10% level	-2.583192	

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

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(IR)  
 Method: Least Squares  
 Date: 04/16/18 Time: 21:07  
 Sample (adjusted): 2 96  
 Included observations: 95 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR(-1)	-0.182635	0.059577	-3.065525	0.0028
C	1.127098	0.391821	2.876565	0.0050
R-squared	0.091774	Mean dependent var		-0.002316
Adjusted R-squared	0.082008	S.D. dependent var		1.356738
S.E. of regression	1.299916	Akaike info criterion		3.383304
Sum squared resid	157.1497	Schwarz criterion		3.437070
Log likelihood	-158.7069	Hannan-Quinn criter.		3.405029
F-statistic	9.397446	Durbin-Watson stat		2.246516
Prob(F-statistic)	0.002844			

## APPENDIX D: COINTEGRATION TEST RESULTS

Date: 04/16/18 Time: 21:42  
 Sample (adjusted): 4 96  
 Included observations: 93 after adjustments  
 Trend assumption: Linear deterministic trend  
 Series: RMBD CPIE M3 IR  
 Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.234150	78.02135	69.81889	0.0096
At most 1 *	0.210876	53.21189	47.85613	0.0144
At most 2 *	0.187909	31.18648	29.79707	0.0344
At most 3	0.076206	11.82923	15.49471	0.1653
At most 4 *	0.046799	4.457485	3.841466	0.0347

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

## APPENDIX E: AUTOCORRELATION

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.167482	Prob. F(3,88)	0.0975
Obs*R-squared	6.605488	Prob. Chi-Square(3)	0.0856

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 04/16/18 Time: 22:12

Sample: 1 96

Included observations: 96

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.62621	57.87091	-0.339138	0.7353
BD	0.089512	0.086697	1.032477	0.3047
M3	-0.023775	0.253524	-0.093780	0.9255
CPIE	4.172342	12.51164	0.333477	0.7396
IR	-0.012553	0.209257	-0.059988	0.9523
RESID(-1)	0.271385	0.114266	2.375028	0.0197
RESID(-2)	0.051440	0.112856	0.455801	0.6497
RESID(-3)	0.020177	0.107615	0.187488	0.8517

R-squared	0.068807	Mean dependent var	2.92E-14
Adjusted R-squared	-0.005265	S.D. dependent var	4.235036
S.E. of regression	4.246170	Akaike info criterion	5.809567
Sum squared resid	1586.637	Schwarz criterion	6.023263
Log likelihood	-270.8592	Hannan-Quinn criter.	5.895947
F-statistic	0.928921	Durbin-Watson stat	1.946918
Prob(F-statistic)	0.488393		

## APPENDIX F: HETEROSKEDASTICITY TEST RESULTS

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.387245	Prob. F(4,91)	0.2446
Obs*R-squared	5.517428	Prob. Chi-Square(4)	0.2382
Scaled explained SS	14.67097	Prob. Chi-Square(4)	0.0054

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 04/17/18 Time: 07:16

Sample: 1 96

Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-652.2604	580.4491	-1.123717	0.2641
BD	-0.705508	0.794409	-0.888092	0.3768
M3	2.012563	2.566508	0.784164	0.4350
CPIE	137.2090	125.5576	1.092797	0.2774
IR	3.528016	2.116840	1.666643	0.0990

R-squared	0.057473	Mean dependent var	17.74871
Adjusted R-squared	0.016043	S.D. dependent var	43.40567
S.E. of regression	43.05607	Akaike info criterion	10.41356
Sum squared resid	168698.1	Schwarz criterion	10.54712
Log likelihood	-494.8510	Hannan-Quinn criter.	10.46755
F-statistic	1.387245	Durbin-Watson stat	1.934184
Prob(F-statistic)	0.244611		

## APPENDIX G: MULTICOLLINEARITY TEST RESULTS

	BD	M3	IR	CPIE
BD	1.000000	-0.056617	0.001997	-0.333652
M3	-0.056617	1.000000	-0.112109	0.115035
IR	0.001997	-0.112109	1.000000	-0.342475
CPIE	-0.333652	0.115035	-0.342475	1.000000

## APPENDIX H: MODEL SPECIFICATION TEST RESULTS

Ramsey RESET Test

Equation: UNTITLED

Specification: RMC BD M3 CPIE IR

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.172961	90	0.8631
F-statistic	0.029915	(1, 90)	0.8631
Likelihood ratio	0.031904	1	0.8582

F-test summary:

	Sum of Sq...	df	Mean Squares
Test SSR	0.566169	1	0.566169
Restricted SSR	1703.876	91	18.72391
Unrestricted SSR	1703.310	90	18.92566
Unrestricted SSR	1703.310	90	18.92566

LR test summary:

	Value	df
Restricted LogL	-274.2811	91
Unrestricted LogL	-274.2651	90

Unrestricted Test Equation:

Dependent Variable: RM

Method: Least Squares

Date: 04/17/18 Time: 07:59

Sample: 1 96

Included observations: 96

Variable	Coefficien...	Std. Error	t-Statistic	Prob.
C	-226.8177	62.20425	-3.646337	0.0004
BD	0.877180	0.094458	9.286457	0.0000
M3	0.399055	0.262305	1.521342	0.1317
CPIE	45.69493	13.40249	3.409435	0.0010
IR	0.401823	0.214411	1.874080	0.0642
FITTED^2	0.001740	0.010058	0.172961	0.8631

R-squared	0.578591	Mean dependent var	0.157722
Adjusted R-squared	0.555180	S.D. dependent var	6.522787
S.E. of regression	4.350363	Akaike info criterion	5.838857
Sum squared resid	1703.310	Schwarz criterion	5.999129
Log likelihood	-274.2651	Hannan-Quinn criter.	5.903642
F-statistic	24.71387	Durbin-Watson stat	1.518732
Prob(F-statistic)	0.000000		

## APPENDIX I: NORMALITY TEST RESULTS

