# Impact of Monetary Policy on the Performance of Agricultural Sector in Kenya

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***Abstract*: The agricultural sector is the bedrock of Kenyan economy and exhibit a potential is employment creation, poverty reduction and increasing food security. This study purposed to examine the impacts of monetary policy on the Agricultural sector gross domestic product in Kenya. Using the annual data for the period of 1981 to 2019, the study conducted empirical analysis to determine the relationship between monetary policy and agricultural domestic product using OLS regression model. The monetary policy instruments that were selected are broad money supply (M2), Central Bank Rates (CBR), Cash Reserve Ratio (CRR) and Exchange Rate (ER). Both ADF and Philip-Perron unit root tests were done to confirm if the variables were stationary and Johansen Co-integration test was done to confirm short and long run relationships. The empirical findings revealed that broad money supply has a positive influence on agricultural GDP while exchange rate displayed a negative impact on the performance agricultural sector. Government's increase of budgetary allocation to support agriculture and monetary policy commission commitment to maintain exchange rate volatility are necessary to realize full potential of agricultural sector.**

***Keywords:*** **Monetary policy, Agricultural performance, OLS, CBR, CRR, Exchange Rates, Money Supply**

## I. INTRODUCTION

Agricultural sector in Kenya combines crop production, fisheries, livestock production and forestry. Agriculture has been and still remains to be the mainstay of the Kenyan economy. It has significant contribution in rural employments and rural incomes, alleviation of poverty, food security and in international trade (Government of Kenya, 2019b). The contributions from the agricultural sector in Kenya accounts directly to an estimate of 26 percent of the Gross Domestic Product (GDP) and also accounts indirectly for about 27 percent through other relations in manufacturing sector, distribution and other several linked sectors. Agriculture contributes 65 per cent of the total exports from Kenya, 18 percent of formal employments and 60 percent of the total employment. The sector is characterized by smallholder production with farm size ranging between 02 and 0.3 hectares accounting for 78 percent and 70 percent of agricultural production and commercial production respectively (Kenya National Bureau of Statistics, 2019).

Agricultural sector has been a crucial force behind the economic growth in Kenya, supporting 80 percent of livelihoods in the rural setups. The Agricultural sector strategy framework which is a revision of the Strategy for Revitalizing Agriculture constitutes the agricultural policies which work in harmony with the Kenya vision 2030 (Government of Kenya, 2019a). Being that the majority of the poor populations are found in the rural areas, the sector is fundamental to the realization of food security and poverty reduction as outlined in the Millennium development Goals (MDGs) (Mabiso et al., 2012). Therefore, improved agricultural production is a crucial factor in poverty alleviation and economic growth in the developing countries. Regrettably, the agricultural production in Kenya is still 2 to 3 times lower in comparison to the international yardstick economies (Kenya Bankers Association, 2018).

There remains a strong correlation between agricultural development and national economic growth. In Kenya, in the first two decades of independence, there was an enormous growth recorded in agricultural sector which complemented its economic growth too. This growth was attributed to the president's *rudini mashambani* (return to the farms) initiative, land tenure systems, technology and reliable research and extension services by the government. Sadly, the growth potential fell on the onset of 1980s to around 2003 when the new government revived extension services and societies to formulate policies towards improving agricultural sector (Republic of Kenya, 2010). Strategy for Revitalizing Agriculture was developed in order to come up with policies to strengthen agriculture. Several agricultural policies were formulated in the move to achieve the main aims of growing productivity and increasing income. These policies target agricultural output stability, commercialization and high-quality optimal production, ecological sustainability and increased employment opportunities (Alila & Atieno, 2016).

The agricultural sector is negatively affected by inadequate supply of inputs, lack of capital, low level of technology adoption, pest and disease invasions, lack of proper storage facilities, poor post-harvest handling, climate change and unsatisfactory extension services. The decline in agricultural sector performance has been attached to the logjams in agricultural production and marketing, comprising broken-down infrastructure, poor commodity market prices, unreliable rainfall patterns majorly in the key food crop regions, high input cost and ineffective marketing organizations (Boulange et al., 2018). Availing credit facilities to the farmers is necessary for them to be able to obtain capital for farm inputs and machinery, and for adoption of modern technology that

improves agricultural production potential. Interventions that will improve agribusiness and access to market, strengthen research and extension, enhance land use and crop development and enable farmers to get access to affordable credit facilities and production inputs in line with favorable policies and legal structures are expedient for prosperity of this sector. Other than the influences that agriculture exerts on other economic sectors, there exists a special correlation with the economy's monetary sector. Since it has a great impact on the country's GDP, it is always targeted by the government policies and more so, the monetary policy (Birch, 2018)

Monetary policy is a deliberate decision and action taken by the Central Bank to control money supply and credit availability in an economy by manipulating the interest rates so as to be consistent with economic growth and the price objectives as set by the government. Main intention for monetary policy is to gain economic price stability through controlled rate of inflation and exchange rate stability (Central Bank of Kenya, 2017). In other economies, the goals of monetary policy are to stabilize prices, maintain equilibrium of balance of payments, creation of jobs, growth of output and for sustainable development. The monetary policy instruments can be direct such as cumulative credit ceilings, exchange control, deposit ceilings and special deposits whereas the indirect policy instruments include Cash Reserves Ratio, open market operations, liquidity ratio, minimum discount rate and selective credit policies (Okay, 2010).

Kenya use different instruments to pursue its monetary policy objectives such as; Open Market Operations (OMO) which involves purchase and sales of securities to control money supply and credit conditions, Central Bank Rates (CBR) whose change in direction and magnitude signal the monetary policy stance, Standing Facilities, Cash Reserve Ratio (CRR) which is a proportion of commercial mandatory liability deposit, Foreign Exchange Market Operation, Kenya Banks' Reference rate (KBRR), Broad Money Supply (M2) and horizontal repos (Central Bank of Kenya, 2014). The Moral Persuasion (MP) is another instrument that the Central Bank uses to as a swaying tool in persuading the commercial banks to adopt certain policy and to operate in a given direction so as to meet the government economic objectives. Therefore, monetary policy becomes a crucial economic variable influencing many sectors of the economy in which agriculture is part (Bonilla, 2019).

Monetary policy acts a key role in the development of agricultural sector directly through provision of resources and indirectly through control of market prices (Quartey & Afful-Mensah, 2014). By regulating the bank rates, monetary policy impacts on the supply of money which in turn leads to a decline in the demand for agricultural output. Therefore, this study seeks to analyze the impacts that the monetary policies have on the performance of agricultural sector in Kenya.

*Monetary Policy in Kenya*

The Central Bank of Kenya (CBK) was instituted in 1966 under the Central Bank Act (CAP 481). It was assigned statutory roles of assisting in the development and maintenance of sound monetary, credit and banking systems to conform to an orderly and a balanced economic development and inflation. CBK was also mandated with the responsibility of maintaining an appropriate foreign exchange level (Kinyua, 2001). To pursue these objectives, CBK implemented its monetary policy by controlling interest rates, credits to commercial banks, and money supply. The first decade of operation, the monetary policies were relatively passive due to lack of adequate understanding in monetary policy management. Further, economy of Kenya had not experienced any macroeconomic crises to battle during this period. In 1967, CBK introduced liquidity ratio and also associated its role as the main holder of foreign exchange (Kinyua, 2001).

The second decade (1970-1980) after independence, Kenyan economy experienced macroeconomic problems which hampered its potential to maintain an admirable economic growth of 6 to 8 percent as it was in the first century. At this time, the exchange rates system of Brixton Woods had collapsed in 1971 followed by oil crisis in 1973. There were attempts to stabilize the balance of payments and local prices that impeded the country's economic growth which stood at a deficit of 362 million and inflation of 7.0 percent by 1971. The resulting crises were due to increased domestic lending in the two previous years which led to a substantial increase in imports. In curbing the situation, CBK introduced minimum cash ratio of 5 percent to the commercial banks in 1971 to complement liquidity ratio of 12.5 percent that was introduced in 1969 (Kinyua, 2001). However, this cash ratio was strapped off in 1972and liquidity ratio was increased and the commercial banks were restricted on giving loans for consumer imports. Effectively, more lending was encouraged to finance local agricultural sector so as to maintain economic growth (Nyorekwa & Odhiambo, 2014).

The projection of further decline in balance of payments and local price inflation that followed the oil crisis of 1973 led the CBK to impose restrictions on the foreign-owned companies to be given loans by the commercial banks in 1973 but was eased in 1974 only for those companies engaging in agriculture, manufacturing, export and tourism. Government borrowing was reduced, minimum deposit rate; the prime borrowing rate and Treasury bill were also raised for the year 1974. Over to 1980s and beyond, the government realized that the economic difficulties were structural and required reforms to meet. The Treasury bonds, cash ratio, flexible exchange rate management, interest rates and open market operations were introduced. The comprehensive economic reform was adopted in 1993 under IMF monitored arrangement that covered fiscal, monetary, structural and external problems (Gichuki et al., 2012).

In Kenya, the monetary policy is controlled by Monetary Policy Committee (MPC) which is constituted of the CBK's senior staffs in charge of the monetary policy analysis and operations. It was formed following gazette notice 3771 of

30th April, 2008. The MPC has since implemented feasible monetary policy measures in order to control inflation rates and to stabilize the exchange rates by fluctuating the CBR occasionally. The CBK also conveys the implementation of monetary policy on the basis of reserve money(Gichuki et al., 2012).

*Kenyan Agricultural Sector Performance*

In Kenya, agricultural sector remains to be the economy's driving engine. The potential contributions are evident in employment creation to over 40% of the population, in the foreign exchange performance, in poverty alleviation and in food security. There has been a persistent decline however in the agricultural contribution to economy from the 40% in 1963, to 33 % in 1980s and to the current 27%. Approximately, 65% of the total earnings from export are from agriculture. Despite the population growth from a total of 11 million people in the 1970s to 47 million in 2019, only 36.5% of the national have remained to be food insecure. This population pressure however, has equally led to fragmentation of the arable land in the regions where agricultural potential is high contributing to a decline in production (Kenya National Bureau of Statistics, 2019).

Majority of the Kenyan farmers rely on rain-fed agriculture despite the shifts in climatic conditions. Around 15% percent of the total land area is Kenya is fertile and experience reliable and sufficient rainfall that can support agriculture. Strategy for Revitalizing Agriculture was launched in 2004 in order to address the challenges in agricultural sector. Its impact was observed when the sector attained a growth of 6.1% in the year 2007. In 2008, the post-election violence interrupted this growth and therefore, Agricultural Sector Development Strategy (ASDS) was formulated to drive the growth to 10% per annum. So far, the new task force managed to achieve a growth of 5.5% in the fall of 2015 despite many production challenges (Oluoch-Kosura, 2016).

The agricultural sector performance in Kenya is constrained by various factors. One of the major institutional factors that affect agricultural sector performance is unfavorable macroeconomic environment through which high interest rates have proved to be a heavy constrain to the sector. The sector also suffers in the hands of strong-willed taxman which subject heavy taxation on farmers and the agro-processors limiting the production levels. The unfavorable terms of trade, drop in the international market prices, tariffs and no-tariff regulations in the developed economies have also slowed down earnings from exports (Alila & Atieno, 2016).

## II. THEORETICAL FRAMEWORK

*Keynesian Theory*

The study is anchored on the Keynesian IS-LM theory of money which covers the combination of equilibrium for the goods market in which investment equals savings and money market where money demand equals supply as developed by John Maynyard Keynes (1883-1946) . A combination of this market equilibrium can be used to determine output and interest rate. This study works with the assumption that output is determined by demand where the demand side of the economy comprise of goods market, money market and foreign exchange which must be all at equilibrium to have the general economy at equilibrium.

In the goods market, equilibrium is attained when the demand and supply of goods and services are equal such that expenditure is equal to income. The equilibrium state can be presented as;

$$y = c + g + i + (x - m) \quad \text{Eqn. 1}$$

Where; $c$: consumption, $g$: government expenditure, $i$: investment, $x - m$: exports and import

These can be expanded to have consumption as a function of income; government expenditure being autonomous; investment as a function of interest rate ($r_t$) and income; export as a function of exchange rate, income of trading partners ($y^f$) and domestic income; and import is determined by income and exchange rates as in Eqn. 2-6 below:

$$c_t = \beta_0 + \beta_1 y_1 \quad \text{Eqn. 2}$$

$$g = \bar{g} \quad \text{Eqn. 3}$$

$$i_t = i_0 + i_1 r_t + i_2 y_t \quad \text{Eqn. 4}$$

$$x_t = x_0 + x_1 e_t + x_2 y^f + x_3 y_t \quad \text{Eqn. 5}$$

$$m_t = m_0 + m_1 y_t + m_2 e_2 \quad \text{Eqn. 6}$$

Substituting the equations (Eqn. 2-6) into Eqn. 1, the IS equilibrium equation for the goods market can be written as:

$$y_t = \frac{(\beta_0 + i_0 x_0 + m_t) + \bar{g} + i_1 r_t + (x_1 + m_2) e_t}{1 - \beta_1 - i_2 - x_3 - m_1} \quad \text{Eqn. 7}$$

The money market is modeled along the standard money demand theories. Real money demand is expressed as a function of real income and interest rate as follows:

$$m^d = \theta_0 + \theta_1 y_t + \theta_2 r_t \quad \text{Eqn. 8}$$

Real money supply is equal to the nominal money balances, M which is assumed to be exogenously determined, deflated by price, P. The money supply is expressed as:

$$m^s = \frac{m_t}{p_t} = \bar{m} \quad \text{Eqn. 9}$$

At equilibrium, money supply equals money demand, thus the money market equilibrium is written as:

$$\bar{m} = \theta_0 + \theta_1 y_t + \theta_2 r_t \quad \text{Eqn. 10}$$

This can be expressed as the LM equation below:

$$y_t = \frac{\bar{m} - \theta_0 - \theta_2 r_t}{\theta_1} \quad \text{Eqn. 11}$$

The external sector is captured by the balance of payment (BoP) equation which shows different combinations of interest rate and income that ensure equilibrium in the balance of

payment. The fundamental identity in the BoP equation is expressed as:

$$B = CA + K \quad \text{Eqn. 12}$$

Where: $B$: Balance in the official reserve transactions account, $CA$: current account balance and $K$: capital accounts balance. The current account balance can be equated to

$$CA = x_t - m_t \quad \text{Eqn. 13}$$

Equating into Eqn. 5 and Eqn. 6;

$$CA = x_0 + x_1 e_t + x_2 y^f + x_3 y_t - (m_0 + m_1 y_t + m_2 e_t) \quad \text{Eqn. 14}$$

The capital account is expressed as:

$$K = \alpha_0 + \alpha_1 r_t \quad \text{Eqn. 15}$$

In order to attain equilibrium in the balance of payment account $B$ must be equal to zero. We therefore substitute Eqn. 14 and 15 into Eqn. 12 with $B = 0$:

$$0 = x_0 + x_1 e_t + x_2 y^f + x_3 y_t - m_0 - m_1 y_t - m_2 e_t + \alpha_0 + \alpha_1 r_t \quad \text{Eqn. 16}$$

Collecting the like terms and simplifying Eqn. 16, the BoP equation is obtained as:

$$y_t = \frac{-\pi_0 - \pi_1 e_t + \pi_2 y^f + \pi_3 + r_t}{\pi_2} \quad \text{Eqn. 17}$$

Where: $(\pi_0 = x_0 + m_0 + \alpha_0;\ \pi_1 = x_1 + m_2;\ \pi_2 = x_3 + m_1$ and $\pi_3 = x_3)$

Combining Eqn.7, Eqn. 11 and Eqn. 17 which are equilibrium conditions in the goods, money and external sectors, respectively and with series of manipulations, the study obtains the equation for output $y$ which is:

$$y_t = \varphi_0 + \varphi_1 e_t + \varphi_2 y^f + \varphi_3 m_t \pm \varphi_4 g_t \quad \text{Eqn. 18}$$

The value for output $(y_t)$ is expected to respond positively to government expenditure $(g_t)$ provided there is no crowding-out effect of government spending and negatively if there is crowding out effect. Income of trading partners $(y^f)$ is expected to impact positively on output since this would promote demand for export. Money supply $(m_t)$ is also expected to promote output growth through reduction in interest rate and stimulation of investment.

## III. METHODOLOGY

*Empirical Model*

The major objective of this study was to determine the impact of monetary policy on agricultural sector performance in Kenya. In order to attain this, multiple regression model was used to analyze the relationship between the monetary policy instruments and agricultural output. The model test the theoretical propositions exemplified by these correlations. It can be specified as below:

$$Y = f(x_1, x_2, x_3, x_4) + \varepsilon_t \quad \text{Eqn. 3.1}$$

Where; $Y$ (Agricultural Output), $x_t$ (Monetary policy instruments) and $\varepsilon_t$ is the error term

Econometrically, Eqn. 3.1 can be transformed into;

$$AGP = \beta_0 + \beta_1 M2 - \beta_2 CBR + \beta_3 CRR - \beta_4 ER + \varepsilon_t \quad \text{Eqn.3.2}$$

Where: $AGP$(agricultural output), $\beta_0 - \beta_4$(Parameter estimates), $M2$(Broad Money Supply), $CBR$(Central Bank Rate), $CRR$(Cash Reserve Ratio) and $ER$(Exchange Rate)

The natural logarithms of the variables were obtained in order to minimize on the problem of attaining spurious regression results. Therefore, the model becomes;

$$lnAGP = \beta_0 + \beta_1 lnM2 - \beta_2 CBR + \beta_3 CRR - \beta_4 lnER + \varepsilon_t \quad \text{Eqn. 3.3}$$

## IV. RESULTS AND DISCUSSIONS

*Test for Stationarity*

Time series data was adopted by the study in order to realize its objectives. Therefore, after declaring data to be time series data, the researcher proceeded to conduct preliminary unit root test to if the variables that will be used in model estimation are stationary so as to minimize on spurious results and illogical regression. Augmented Dickey-Fuller (ADF) and Philip-Perron unit root tests were used to test if the variables were stationary at their level and also at first differences after integration by order of one I(1). The results presented in table 1 indicate that the variables; agricultural production (AGP), broad money supply (M2), Cash Reserve Ratio (CRR) and exchange rates (ER) we stationary at first difference, I (1) while Central Bank Rate (CBR) was stationary at level. Therefore, it is possible to adopt a dynamic time series model.

Table 1: Unit Root Test

| Variable | Augmented Dickey-Fuller | | | Philips-Perron | | |
|---|---|---|---|---|---|---|
| | Levels | First Difference | Order of Integration | Levels | First Difference | Order of Integration |
| Agp | -1.880 | -5.583*** | I(1) | -1.983 | -5.572*** | I(1) |
| M2 | -1.466 | -5.970*** | I(1) | -1.779 | -6.029*** | I(1) |
| Cbr | -4.672*** | _ | I(0) | -4.643*** | _ | I(0) |
| Crr | -2.463 | -5.889 | I(1) | -2.547 | -5.888*** | I(1) |
| Er | -1.530 | -7.143 | I(1) | -1.378 | -7.312*** | I(1) |

*Source: Author's computation*

*Co-integration Test*

Johansen Co-integration test was carried out so as to check for the long run relationship among the variables under investigation. Both trace statistics and maximum Eigen-value were employed to test for the long run relationship. The findings revealed that the variables demonstrated a long run relationship centered upon the approval of the decision criteria chosen. The trace statistic results reveal that there is at most one co-integration equation while maximum Eigen value test reveals no correlation. Therefore, using the trace value criterion, the null hypothesis ($H_o$) was rejected in favor of the alternative ($H_1$) that there exist a long run relationship between the dependent variable and independent variables.

Table 3: Johansen tests for co-integration

| Hypothesized No. of CE(s) | Eigen value | Trace Statistics | Critical Values | | Comment |
|---|---|---|---|---|---|
| | | | 5% | 1% | |
| None | | 82.0154 | 68.52 | 76.07 | Reject Hypothesis |
| At most 1 | 0.71767 | 33.9578 | 47.21 | 54.46 | Reject Hypothesis |
| At most 2 | 0.44113 | 11.8481 | 29.68 | 35.65 | Fail to reject Hypothesis |
| At most 3 | 0.15996 | 5.2246 | 15.41 | 20.04 | Fail to reject Hypothesis |
| At most 4 | 0.12504 | 0.1488 | 3.76 | 6.65 | Fail to reject Hypothesis |
| Max Eigen Value | | | | | |
| None | | 48.0576 | 33.46 | 38.77 | Reject Hypothesis |
| At most 1 | 0.71767 | 22.1097 | 27.07 | 32.24 | Fail to reject Hypothesis |
| At most 2 | 0.44113 | 6.6235 | 20.97 | 25.52 | Fail to reject Hypothesis |
| At most 3 | 0.15996 | 5.0758 | 14.07 | 18.63 | Fail to reject Hypothesis |
| At most 4 | 0.12504 | 0.1488 | 3.76 | 6.65 | Fail to reject Hypothesis |

*Source: Author's Computation*

There exist several criteria which can be used to determine the optimal lag length. In this study, FPE, AIC, HQIC and SBIC were used choose lag length as in table 2. The results show that AIC and SBIC criterion selected 1 and 4 lag respectively. The study therefore used SBIC to select the optimal lag length in which one (1) lag structure was adopted.

Table 2: Lag Selection-order Criteria

| Lag | LogL | LR | FPE | AIC | HQIC | SBIC |
|---|---|---|---|---|---|---|
| 0 | 36.8444 | | 1.1e-07 | -1.81968 | -1.74298 | -1.59749 |
| 1 | 200.197 | 326.71 | 4.2e-11* | -9.72555 | -9.26535* | -8.3924* |
| 2 | 218.517 | 36.639 | 6.7e-11 | -9.34381 | -8.5001 | -6.89969 |
| 3 | 248.871 | 60.709 | 6.4e-11 | -9.64978 | -8.42257 | -6.0947 |
| 4 | 285.044 | 72.346* | 5.9e-11 | -10.2882* | -8.67751 | -5.62218 |

*Source: Author's computation*

*Where* ***** shows the order selected by criterion

(FPE: final Predictor error; AIC: Akaike information criterion; HQIC: Hannan-Quinn information criterion and SBIC: Schwarz information criterion

*Test for Serial correlation*

The study used Breusch-Godfrey LM test to test for any serial correlation in the model. The results strongly reject the null hypothesis (H0) that there is no first-order serial correlation

Table 4: Breusch-Godfrey LM test for autocorrelation

| lags(p) | F | Df | Prob > F |
|---|---|---|---|
| 1 | 19.642 | (1, 33) | 0.0001 |
| H0: no serial correlation | | | |

*Source: Author's Computation*

*Test for Heteroskedasticity*

The Breusch-Pagan / Cook-Weisberg test was used to assess for heteroskedasticity. The results findings show that the probability value of the chi-square is less than 5%. Hence, we reject the null hypothesis (H0) for equal variance in favor of the alternative at 5% significance level. There exists heteroskedasticity in the residual estimate.

Table 5: Breusch-Pagan / Cook-Weisberg test for Heteroskedasticity

| Ho: Constant variance<br>Variables: fitted values of agp | |
|---|---|
| chi2(1) = 16.64 | Prob > chi2 = 0.0000 |

*Source: Author's Computation*

*Impact of Monetary Policy on Agricultural Output*

The Ordinary Least Square Method was used to examine the influence of various monetary policy instruments (independent variables) on agricultural output (dependent variable). The findings are presented in table 6.

From the regression analysis, the adjusted coefficient of determination ($R^2$) was found to be 0.8071. This implies that the model explains 80.71% of the relationship that exists between the agricultural output and selected monetary policy instruments. The F-value (Prob > F = 0.0000) is also significant at 1% level of significance, confirming that the model used in estimating the variable relationships was fit. This implies that the monetary policy in Kenya has an impact on the agricultural sector performance. The Durbin-Watson Statistic was found to be 1.2983453, revealing that there was no autocorrelation between the Agricultural sector output and money supply, central bank rate, cash reserve ratio and exchange rates. The regression results reveal that there exists a positive relationship between the agricultural output and the broad money supply (M2) and Cash Reserve Ratio (CRR) while the Central Bank Rate (CBR) and Exchange rate (ER) exhibit a negative correlation according to the priori expectations. The variables Money Supply (M2) and exchange rates (ER) were found to be statistically significant at 5% level of significance.

The variable money supply (M2) was significant (P>|t| =0.000) with a positive coefficient according to a priori expectations. This indicates that with an increase in the broad money supply to the economy, there is a significant increase in agricultural output. This finding conforms to the quantity theory of money that maintains that a rise in money base is directly proportional to the agricultural output growth since more will be invested. Increased broad money supply also enables the farmers and stakeholders to have access to agricultural production inputs and technological advances which therefore leads to a boost in the general output. Similar findings were also obtained by the studies of (Emmanuel et al., 2015) and (Sitima & Sibanda, 2014).

From the analysis, the exchange rate (ER) was also found to be significant (P>|t| =0.000) but with a negative coefficient. This relationship implies that an appreciation in exchange rates have a negative effect on the growth of earnings from agriculture. The aggregate export earnings will negatively influence agricultural sector performance when the currency is devalued. This finding corroborate the evidence from studies conducted by (Adekunle & Ndukwe, 2018; Huseynov et al., 2019; Kandilov, 2008; Oye et al., 2018) who in their analysis found an evidence of exchange rate affecting the share of agriculture in gross domestic product negatively. Similarly, the finding conforms with the study of (Muraya, 2014) who obtained a negative influence of exchange rate on Kenya's agricultural productivity and opine that it is attributed to the effect on price of imported inputs.

## V. CONCLUSION AND RECOMMENDATION

The substantial contribution of agricultural sector to the Kenyan economy is applauded. This study attempted to conduct an empirical analysis in order to examine the impact of selected monetary policy instruments on the performance of the agricultural sector in Kenya using time series data for the period of 1981 to 2019 through multiple regression method. The selected monetary policy instruments for analysis were money supply (M2), Central Bank Rates (CBR), Cash Reserve Ratio (CRR) and Exchange Rate(ER) which were used determine the influence on agricultural output. The variables money supply (M2) and Exchange Rate (ER) were found to have a significant impact on the agricultural performance. Therefore, the study established that the monetary policy instruments have an impact on the performance of agricultural sector in Kenya.

The study recommends that there should be an increase on the budgetary allocation in support of agricultural sector consistently. This will avail enough funds to the agricultural sector which the farmers can access to invest more in agricultural production and hence improve in the sector's contribution to the country's economy. Accordingly, the monetary policy commission should actively monitor exchange rate volatility and impose measures that will lessen volatility in order to experience the full potential of agricultural sector contribution.

Table 6: Regression Results

| AGP | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. Interval] | |
|---|---|---|---|---|---|---|
| M2 | 4.594896*** | .5846752 | 7.86 | 0.000 | 3.406693 | 5.783099 |
| CBR | -14.43887 | 18.96374 | -0.76 | 0.452 | -52.97784 | 24.10009 |
| CRR | 6.722063 | 6.75629 | 0.99 | 0.327 | -7.00837 | 20.4525 |
| ER | -5.723452*** | 1.260347 | -4.54 | 0.000 | -8.284785 | -3.162119 |
| _cons | -70.50364*** | 11.41013 | -6.18 | 0.000 | -93.69182 | -47.31546 |

Number of obs = 39
F( 4, 34) = 40.74
Prob > F = 0.0000
R-squared = 0.8274
Adj R-squared = 0.8071
Root MSE = 1.6852
Durbin-Watson = 1.2983453

*Source: Author's computation (******* Significant at 1%, ****** Significant at 5% and ***** Significant at 10%)*

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