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PLACING EASTERN AND SOUTHERN AFRICA UNDER THE LENS TO IDENTIFY THE DETERMINANTS OF MONETARY AND FISCAL POLICY

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Abstract

Despite being home to both some of the world's fastest emerging markets and a number of the poorest, the East and Southern Africa region exhibits noticeably a variety of levels of economic development either nationally or internationally. The region never attracted enough attention from economist and policymakers. As a result, the current study placed the Eastern and Southern African nations under microscope to explore the determinants of monetary and fiscal policy during the period from 1990 to 2020. In addition, to carry on with the empirical findings a quantile regression and generalized linear model were performed. The study's findings indicate that elements like tax revenue and exportation have a significant impact on monetary policy, whereas interest rates, labor force, exports, imports, and tax revenue have a significant impact on fiscal policy. In conclusion, it is important to highlight that in the Eastern and Southern Africa, macro-microeconomic factors appear to be affecting fiscal policy in contrast with the monetary policy, which is only influenced by exportation and tax revenue. The study advances empirical research in the field of economic development and offers information to decision-makers and African community about how to manage monetary and fiscal policy in accordance with national needs.

Keywords: *Monetary Policy, Fiscal Policy, Economic Development, Eastern and Southern Africa*

Jel Classification: *E51, E62, F45*

PARA VE MALİYE POLİTİKASININ BELİRLEYİCİLERİNİ BELİRLEMEK İÇİN DOĞU VE GÜNEY AFRİKA'NIN MERCEK ALTINA YERLEŞTİRİLMESİ

Öz

Hem dünyanın en hızlı gelişen pazarlarından bazılarına hem de en yoksullarından bazılarına ev sahipliği yapmasına rağmen, Doğu ve Güney Afrika bölgesi, hem ulusal hem de uluslararası düzeyde fark edilir derecede çeşitli ekonomik gelişme seviyeleri sergilemektedir. Bölge, ekonomistler ve politika yapıcılardan hiçbir zaman yeterince ilgi görmedi. Sonuç olarak, mevcut çalışma, 1990'dan 2020'ye kadar olan dönemde para ve maliye politikasının belirleyicilerini araştırmak için Doğu ve Güney Afrika ülkelerini mikroskop altına yerleştirdi. Ayrıca ampirik bulgulara devam etmek için kantil regresyon ve genelleştirilmiş doğrusal model gerçekleştirilmiştir. Çalışmanın bulguları, vergi geliri ve ihracat gibi unsurların para politikası üzerinde önemli bir etkiye sahip olduğunu, faiz oranlarının, işgücünün, ihracatın, ithalatın ve vergi gelirlerinin ise maliye politikası üzerinde önemli bir etkiye sahip olduğunu göstermektedir. Sonuç olarak, Doğu ve Güney Afrika'da sadece ihracat ve vergi gelirlerinden etkilenen para politikasının aksine makro-mikroekonomik faktörlerin maliye politikasını etkilediğini vurgulamak önemlidir. Çalışma, ekonomik kalkınma alanındaki

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ampirik araştırmaları ilerletmekte ve karar vericilere ve Afrika topluluğuna, ulusal ihtiyaçlara uygun olarak para ve maliye politikasının nasıl yönetileceği hakkında bilgi sunmaktadır.

Anahtar Kelimeler: *Para Politikası, Maliye Politikası, Ekonomik Kalkınma, Doğu ve Güney Afrika*

Jel Sınıflandırması: *E51, E62, F45*

INTRODUCTION

There are two primary macroeconomic policies (fiscal policy and monetary policy) that can be employed by policymakers to control the condition of an economy on the concept of economic growth. The argument is that fiscal and monetary policies work best together. While Keynesian economists argue that fiscal policy instead of monetary policy has a bigger impact on economic activity, mainstream economists claim that monetary policy has a greater impact on economic activity. The government uses fiscal policy, a requirement measure, to accomplish its macroeconomic goals. Among these goals, economic expansion, decreasing inflation, reducing unemployment, and trade equilibrium are macroeconomic goals (Havi and Enu, 2014: 61).

In academics at least, the concern of regulating monetary and fiscal policy has been approached in a totally different way over the past 25 years. The distinctiveness of sustainable pricing trajectories has once again come up, partly as a result of central bankers' desire to use interest rates as the primary tool of monetary policy. As a result, fiscal policy is again believed to have a more essential role to play in setting and regulating prices. Increasing or decreasing taxes or lowering or raising government expenditures are the two main components of fiscal policy. All of these actions are taken to affect overall demand. The government can employ monetary policy, on the other hand, as a required measure to accomplish macroeconomic goals. Changes in the money supply, interest rates, and exchange rates all result in the creation of monetary policy. If we suppose that an economy wishes to grow, the authorities might reduce interest rates through the central bank, which would additionally lead the rate of exchange to decline (Alagidede et al., 2020: 23).

Carraro and Karfakis (2018) stated that despite being essential for predicting the effects of national policies, two aspects of the macro policy reaction have garnered minimal analytical attention. First, in an effort to increase economic activity, monetary and fiscal policies have engaged simultaneously. Numerous studies have shown that the importance of policy interactions in determining equilibrium is overlooked when monetary and fiscal policies are separated. Increased government inefficient expenditure triggers intra- and intertemporal replacement consequences, as well as an output gap.

The responses of wage growth, employment, spending, and inflation depend on the relative magnitudes of these factors. Most assessments include the assumption of inactive fiscal action, which pairs increases in government spending with corresponding increases in aggregate taxes to cover for the expenditure, as well as active monetary policy. This policy framework causes the intra-temporal substitution effect to occur when more public expenditure enhances economic activity, which in turn raises the demand for labor because the output is demand-determined (Jha and Afrin, 2017: 65-66).

The core of monetary economics has always been pricing regulation. And it's true that conventional discussions of how prices are set gave the impression that fiscal policy had little to no bearing. Fundamentally, "macroeconomics arithmetic" and the extensive books that followed described the interplay for both monetary and fiscal policy as a conflictual game seen between government and its central bank; synchronization of fiscal and monetary policies was required to produce Pareto principal improving results. The inspiration for most

of this work comes from the fact that several central banks execute monetary policy by using a rate of interest rather than the money supply (Betts et al., 2016).

1. MACROECONOMIC DETERMINANTS OF THE MONETARY AND FISCAL POLICY

This section provides an overview of the numerous macroeconomic indicators that contributed to determining monetary and fiscal policy. Price level analysis is one of the primary macroeconomic indicators. The average level of prices in an economy at any given period is represented by a price level indicator.

Additionally, elements like scarcity of jobs, borrowing costs, and the rate of economic expansion of a nation have an impact on the country's monetary and fiscal policy. The inflation rate is a crucial macroeconomic measurement. The price of identical products and services constantly increasing over time is referred to as inflation. Rates of inflation indicate an economy that is running out of money, whereas inflation that is kept under control indicates an economy that is booming. The social, economic, and political framework of a nation may be compromised and interfered with by high inflation rates. Millions of people deal with growing prices that they have no control over, which frustrate them. Inflation also increases borrowing costs, which hurts investment. Public deficits are impacted by high and rising inflation rates since the governing authorities are unable to issue debt. As a result, this affects the fiscal policy of any nation (Martins, 2019: 23).

The unemployment rate is another important macroeconomic measurement. The unemployment rate is the proportion of the labor force that is jobless at any given time to the total labor force. Rates of unemployment provide insight into an economy's overall state of functioning today. It offers a measurement of the workforce, labor input, employment structure, and level of resource utilization. Rates of unemployment have a negative impact on the growth of the economy. An economy's long-term growth is negatively impacted by high and persistent unemployment rates. And this affects the targeted plan of the fiscal policy (Van Neuss, 2019: 25).

Last but not least, government spending is a crucial macroeconomic indicator. The economy's overall demand would rise if government spending increased. Increasing productivity and labor would result from this growth in aggregate demand. In addition, Samuel and Oruta (2021) claim that government spending boosts economic productivity regardless of how municipal budget and economic growth are evaluated.

The main goal of this paper is to identify the determinants of monetary and fiscal policy in Eastern and Southern Africa. Thus, the study concentrates on Eastern and Southern Africa from the period 1990 to 2021. Additionally, the broad money percentage of GDP is employed as a proxy for the monetary policy. Whereas, general government final consumption expenditure (current US$) is considered a proxy for fiscal policy.

The study's remaining sections are structured as follows: Section 2 provides a summary of the related literature. Section 3 explains the technique and data sources in more detail. Section 4 follows, in which the study's empirical findings are expanded upon, and section 5 presents the results. In the sixth section, discussion is given.

2. REVIEW OF THE LITERATURE

Since at least the early 1980s, Eastern and Southern Africa have served as a crucial testing ground for community-based conservation strategies. Through field studies and

institutional policy changes, the region was pivotal in the 1990s in the global adoption of community-based initiatives. Rekindled interest in the topic of monetary and fiscal policy interaction includes the worldwide financial crisis of 2008 and the emergent coronavirus illness (COVID-19) pandemic (Kibwe, 2016: 11-12). Numerous developed nations, including the US, responded to the financial unrest and the ensuing significant decline in economic activity with unprecedented policy measures. Unconventional monetary policies were implemented along with a drastic reduction in the short-term nominal interest rate to the zero lower bound. Large-scale fiscal stimulus programs were put in place. This circumstance made it clear that, especially for developing market economies, a better awareness of how monetary and fiscal policies interplay and have an influence on macroeconomic trends is necessary. The current context of low-interest rates limits central banks' capacity to maintain a healthy economy, and the increasing and high amounts of public borrowing restrict the fiscal policy choices open to them (Akram and Das, 2020: 13).

The scenario is significantly more difficult in Eastern and Southern African economies. In addition to having little room for policymaking, Eastern and Southern African markets must deal with a decline in both internal and external demand, unstable market situation, record budget deficits, and falling currencies. Although design factors have been used to examine the relationship between monetary and fiscal policy in African countries. Nevertheless, the macroeconomic and micro factors have received significantly less interest (Aye, 2021: 6).

Diverse public authorities that may have different goals and focus on various facets of promoting macroeconomic stability implement monetary and fiscal policies. Monetary and fiscal policies are deeply intertwined. As tools of the state with preferential access to resources, both are inextricably linked. The responsible use of these authorities by policymakers is a requirement for achieving general economic stability (Corsetti et al., 2013). The relationship between monetary and fiscal policy has come to light as a result of the COVID-19 issue. Financial and governmental institutions collaborated to stabilize markets and support activity in the face of an unprecedented economic meltdown. The government and the central bank both have important policy-related responsibilities. And both are instruments by which the state acquires exclusive access to resources, through respectively the ability to tax and the capacity to issue "money" in the form of irredeemable debt that serves as a medium of exchange. The capacity of the central bank to establish interest rates, which allows it to have a significant impact on the economy, is based in large part on the availability of money (Gete and Melkadze, 2018: 21-22).

As a result of an underlying social contract, these functions are used. On the basis that it enables the delivery of crucial services to society, taxation is approved. Money must be accepted as a means of exchange and a unit of account in order to be issued, and a steady value is essential for this. The ability to tax and print money mutually supports one another (Kaminska and Roberts-Sklar, 2018: 12). The necessity to pay taxes in cash most directly contributes to creating a demand for cash and supporting its value. In turn, a sound monetary system supports taxation. Lack of control over how interest rates are used can lead to financial crises with widespread defaults and uncontrolled inflation. Such occurrences would accompany a collapse, substantial shifts in wealth and output.

Woodford and Walsh (2005) noted that the monetary administration would be required to generate money creation revenue in order to equalize the government's budget if fiscal policy operated independently. By examining the equilibria generated by these monetary and fiscal characteristics, Leeper (1991) investigated the relationship between monetary and fiscal policy. In this approach, fiscal policy determines the level of direct taxation in reaction to the increase in public debt, while monetary policy determines the long-term interest rate

as a consequence of actual inflation. The boundaries of fiscal policy guidelines establish how independent each revenue stream is from one another. The criteria for an active stance presuppose that fiscal policy does not adjust to the constraints that must be implemented to preserve equilibrium. For instance, the fiscal authority is more concerned with rising levels of economic activity than with the sustainability of the national debt. On the other hand, according to the rules of active monetary policy, the central bank's control over interest rates must take into account the restrictions that must be put in place to preserve equilibrium. The dimensions of the monetary regulators' passive attitude would indicate no increase in the base rate while inflation increases; alternatively, the monetary stance is active. The main interests of the monetary authority are preserving price stability rather than the degree of economic activity or employment.

The relative impact of fiscal and monetary policy on economic growth in Nigeria was explored by Adefeso and Mobolaji (2010). Data from annual time series were used between 1970 and 2007. The analysis used cointegration and methods for estimation of error repair. The study's findings showed that the impact of fiscal policy was far weaker in Nigeria than the monetary policy to support economic growth policy. They suggested that in order to stabilize Nigeria's economy, policymakers should place a strong emphasis on monetary policy.

In Pakistan between 1981 and 2009, Jawaid et al. (2010) looked at the comparative impact of fiscal and monetary policies on economic growth. A good long-term link between fiscal and monetary policy and economic growth was confirmed by the cointegration test. It was discovered that monetary policy stimulated growth in Pakistan more effectively than fiscal policy. They advocated for policymakers to prioritize monetary policy above fiscal policy in order to promote economic growth.

In South Asian nations, the impact of monetary and fiscal policy on economic growth was studied by Ali et al. (2008) monthly time series data were used from 1990 to 2007. The model used was the autoregressive distributed lag model. The findings indicated that whereas fiscal policy had a negligible short-term and long-term impact on economic growth, the money supply had a favorable and considerable long-term impact.

3. THE EFFECTIVENESS OF FISCAL AND MONETARY POLICIES ACROSS AFRICA

Although South Africa's budgetary history since 1994 has been marked by unprecedented achievement in key areas like strengthening the debt-to-GDP ratio, reducing interest costs, achieving a sizable allocation of funds from wealthier to disadvantaged families, and implementing a multi-year and forward-looking structure for financial management, some of its aspects were contentious. The importance of fiscal policy in promoting development is one area of contention, with detractors calling for an increasingly expansionary fiscal posture to increase the economy's long-term growth rate. Additionally, there is debate concerning the fiscal policy's volatility, or the assertion that it has turned pro-cyclical in South Africa and many other emerging nations (Du Plessis et al., 2007: 6).

Using yearly data from 1970 to 2007, Adefeso and Mobolaji (2010) examined the proportional impact of fiscal and monetary policies on economic development in Nigeria. Their findings demonstrated that monetary policy had a far greater impact than fiscal policy, and even excluding the degree of openness did not reduce the magnitude of the larger impacts.

Moreover, using the VAR approach, Nwaogwugwu and Evans (2016) looked into how monetary and fiscal policies affected various sectors of the Nigerian economy. They demonstrated that just three sectors of the Nigerian economy—agriculture, services, and wholesale—have substantial sectoral production elasticity with regard to monetary policy initiatives, however the importance varies from sector to sector depending on the quality and layout of organizational characteristics in each sector. No industry is significantly impacted by changes in fiscal policy.

Revenues associated with commodities are particularly impacted since commodity exporters are seeing significant decreases in net exports and decreased demand for their shipments. Commodity-related earnings make up a sizable portion of budgetary income in numerous African nations (e.g., Angola, Botswana, Chad, Gabon, Republic of Congo, and Nigeria). To combat growing poverty rates, nations will need to increase expenditure on pro-poor programs and safety nets. On the other hand, nations that raised fuel and food subsidies during the price surge of 2007–2008 ought to be able to reduce these assistance. Burkina Faso, Mozambique, Niger, and Senegal are nations which have already transitioned out periodic restrictions of customs charges and levies (Berg et al., 2009: 5).

A stronger countercyclical monetary strategy is possible in some African nations, especially those where prices has lately been on the down. Few African nations confront the "zero interest rate policy" limit, which provides little opportunity for monetary policy to act, especially those that are not participants of a shared currency, despite the fact that monetary policy transmission channels are inadequate in some countries. Additionally, for an efficient policy approach to the crisis, monetary and fiscal policy coordination will be crucial (Bonga-Bonga, 2019).

Mwega (2011) looked at Kenya's condition between 1998 and 2007 and found that monetary changes encouraged the country's economy and increased manufacturing competitiveness. Additionally, between the early 1970s and 2002, Mansouri (2008) examined the relative efficiency of fiscal policy in Morocco, Egypt, and Tunisia. According to empirical data, a 1% increase in fiscal expenditure raised the real GDP in Tunisia by 1.15%, in Morocco by 1.26%, and in Egypt by 0.56%.

Despite employing both a systemic identification technique and reserve money as the policy variables, Montiel et al. (2012) discovered that monetary policy shocks had no discernible influence on either production or pricing in Tanzania. Mugume (2009) discovered that Uganda's output and prices didn't react strongly to changes in monetary policy.

4. METHODOLOGY

4.1. Variables Description

This study employed the broad money percentage of GDP as a proxy for the monetary policy. Whereas, general government final consumption expenditure (current US$) is considered a proxy for fiscal policy. To assess the determinants of these policies, labor force, gross capital formation, inflation of GDP deflator, imports of goods and services, exports of goods and services, interest rate, and tax revenue were selected. The study concentrates on eastern and southern Africa from the period 1990 to 2021.

Table 1: An Overview of the Variables

Variables	Definition	Source
MS	The Broad money (% of GDP) represents monetary policy	All the data were extracted from the World Bank indicators.
FP	The General government's final consumption expenditure (current US$) represents the fiscal policy.	
LE	Labor force, Total	
CF	Gross capital formation (current US$)	The data study focuses on Eastern and Southern Africa.
INF	Inflation, GDP deflator (annual %)	
IM	Imports of goods and services (current US$)	
EX	Exports of goods and services (current US$)	The period is 32 years (1990 until 2021).
INT	Interest rate spread (lending rate minus deposit rate, %)	
TR	Tax revenue (% of GDP)	
MS= ∫ (LE, CF,INF, IM, EX, INT, TR) +ε		The mathematical formulation of the study.
FP= ∫ (LE, CF, INF, IM, EX, INT, TR) + ε		

4.2. Empirical Model

To carry on with the study a normal generalized linear model (GLM) and quantile regression were performed to explore the determinants of the monetary and fiscal policy. Below we specify the two-equation models adopted by the study. Starting with the GLM.

$$Y_i = \beta_0 + \beta_1 x_{\text{it}} + \beta_2 x_{\text{it}} + \cdots + \beta_{\text{n}} x_{\text{it}} + \varepsilon_i \quad (1)$$

$$\text{MS}_{it} = \beta_0 + \beta_1 \text{LE}_{it} + \beta_2 \text{CF}_{it} + \beta_3 \text{INF}_{it} + \beta_4 \text{IM}_{it} + \beta_5 \text{EX}_{it} + \beta_6 \text{INT}_{it} + \beta_7 \text{TR}_{it} \ldots + \varepsilon_{\text{i}} \quad (2)$$

$$\text{FP}_{it} = \beta_0 + \beta_1 \text{LE}_{it} + \beta_2 \text{CF}_{it} + \beta_3 \text{INF}_{it} + \beta_4 \text{IM}_{it} + \beta_5 \text{EX}_{it} + \beta_6 \text{INT}_{it} + \beta_7 \text{TR}_{it} \ldots + \varepsilon_{\text{i}} \quad (3)$$

In this model, y is considered the reliant variable, while x stands for the explanatory factor. ε signifies the residual of y and finally, β is the mean regression boundaries.

In this paper the quantile regression model that indicates the simple linear regression of quantile Q is. According to Koenker and Bassett (1978) we perceive that q presents the particular quantile 0<q<1. See equation (4).

$$y_i = \beta_0^q + \beta_1^q x_i + \varepsilon_i \quad (4)$$

After presenting the simple quantile regression, now the assessment for this case includes the minimization of the weighted amount of the outright numbers of the residuals for quantile q. We notice that $\hat{y}_i^q = \beta_0^q + \beta_1^q x_i$ and $(1-q)$ are the weight.

$$\min\left[q \sum_{i=1}^{N} \left|y_{min} - \hat{y}_i^q\right| + (1-q) \sum_{i=1}^{N} \left|y_i - \hat{y}_i^q\right|\right] \quad (5)$$

Equation (6), (7), and (8) is a rectified version of equation 5 which measured by reducing the function. In this case the ρ_τ is known as the check value and τ is considered the definite quantile (Angrist and Pischke, 2009).

$$\text{argmin}\left[\sum_{i=1}^{N} \rho_\tau\left(y_i - \hat{y}_i^q\right)\right] \quad (6)$$

$$(\beta_0^\tau, \beta_1^\tau, \beta_2^\tau, \beta_3^\tau, \beta_4^\tau, \beta_5^\tau, \beta_6^\tau, \beta_7^\tau, \beta_8^\tau) = \text{argmin} \sum_i \rho_\tau [y_i - (\beta_0 + \beta_1 \text{MS} + \beta_2 \text{LE} + \beta_3 \text{CF} + \beta_4 \text{INF} + \beta_5 \text{IM} + \beta_6 \text{EX} + \beta_7 \text{INT} + \beta_8 \text{TR})] \quad (7)$$

$$(\beta_0^\tau, \beta_1^\tau, \beta_2^\tau, \beta_3^\tau, \beta_4^\tau, \beta_5^\tau, \beta_6^\tau, \beta_7^\tau, \beta_8^\tau) = \text{argmin} \sum_i \rho_\tau [y_i - (\beta_0 + \beta_1 \text{FP} + \beta_2 \text{LE} + \beta_3 \text{CF} + \beta_4 \text{INF} + \beta_5 \text{IM} + \beta_6 \text{EX} + \beta_7 \text{INT} + \beta_8 \text{TR})] \quad (8)$$

5. RESULTS

Table 2 presents the descriptive statistics of the variables employed in this study. MS which is the money supply of eastern and southern Africa showcases a mean value of 42. This suggests that 42.16% of currencies and cash are circulating in the region with a maximum value of 54.53% and minimum value of 0. Whereas standard deviation depicts the variation from means. Furthermore, PS which stands for the general government's final consumption expenditure revealed a mean value lower than the money supply. In eastern and southern Africa, government consumption appears to be reaching a maximum value of 11.22% to a minimum value of 10.56% which implies over the last years the quantity of fiscal policy in the region has not significantly changed. The trade balance which is composed of the IM (importation of goods and services) and EX (exportation of goods and services) seems to be performing efficiently due to not revealing a negative value in max and min. The standard deviation for all the variables except MS and TR which displays high volatility appears consistent.

Table 2: Descriptive Statistics

	MS	FP	LE	CF	INF	IM	EX	INT	TR
Mean	42.16	10.89	8.2710	10.67	8.63	11.13	10.738	7.323	10.82
Median	44.20	10.90	8.273	11.04	8.264	11.19	11.09	8.2379	8.570
Maximum	54.538	11.22	8.458	11.39	14.453	11.51	11.46	11.158	33.291
Minimum	0.000	10.564	8.079	0.00	4.085	10.69	0.000	0.000	0.000
Std. Dev.	9.242	0.2602	0.113	1.972	2.95	0.304	1.982	3.3385	11.995
Skewness	-2.958	0.014	-0.014	-5.183	0.38	-0.13	-5.192	-1.563	0.539
Kurtosis	14.655	1.247	1.834	28.614	2.137	1.317	28.68	3.996	2.0030
Jarque-Bera	227.81	4.0980	1.8131	1018.11	1.768	3.879	1023.2	14.369	2.879
Observations	32	32	32	32	32	32	32	32	32

The correlation's outcome demonstrates the correlation between the variables. In Table 3 we observe that the EX and MS have the strongest correlations, while IM has a substantial positive association with both FP and LE. This suggests that an increase will cause the money supply to rise. Additionally, a rise in importation reveals to increase the government consumption and the labor force. On the other hand, INF is strongly uncorrelated with all the variables with a value of -0.249, -0.785, -0.871, and -0.316 respectively. This tells us that the level of inflation in eastern and southern Africa is reducing the amount of money supply, government consumption, labor force, and gross capital formation.

Table 3: Correlation Matrix

Variable	MS	FP	LE	CF	INF	IM	EX	INT	TR
MS	1.000								
FP	0.283	1.000							
LE	0.204	0.936	1.000						

CF	0.162	0.382	0.440	1.000					
INF	-0.249	-0.785	-0.871	-0.316	1.000				
IM	0.321	**0.982**	**0.924**	0.407	-0.769	1.000			
EX	**0.897**	-0.064	-0.163	0.000	0.058	-0.039	1.000		
INT	0.299	0.333	0.503	0.436	-0.514	0.428	0.123	1.000	
TR	0.501	0.589	0.486	0.257	-0.431	0.662	0.271	0.297	1.000

Before conducting the quantile regression, we first need to evaluate the results of the generalized linear model and then compare it with the quantile results to observe if there is a change in quartiles in relevance with the GLM. Starting with the monetary policy we remark that only the exportation of goods and services reveals to have a significant positive impact on MS. This signifies that a 1% increase in exportation in eastern and southern Africa expands the money supply of the region by 4.27%. On the other hand, the rest variables demonstrate no remarkable impact on the monetary policy. Based on that we conclude exportation is a crucial factor that determines the quantity level of money supply in the region. Next, we assess the outcomes of the fiscal policy, and contrary to the monetary policy we perceive that the interest rate, labor force, exportation, importation, and tax revenue have a significant impact on the fiscal policy. Nevertheless, the impact varies for instance the labor force, exportation and importation display a positive influence on the fiscal policy because a 1% increase in these factors reveals to expand the government consumption for expenditure by 0.58%, 0.006%, and 0.708%. Whilst, an increase in the interest rate and tax revenue of eastern and southern Africa seems to be decreasing the fiscal policy by 0.012% and 0.001% consecutively. Finally, gross capital formation and inflation rate have not manifested an apparent influence on both policies. See Table 4.

Table 4: Generalized Linear Model Results for both the Monetary Policy and Fiscal Policy

Variables	**MS (Monetary Policy)**			**FP (Fiscal Policy)**		
	Coefficient	**Std. Error**	**Prob**	**Coefficient**	**Std. Error**	**Prob**
INT	0.030	0.178	0.863	**-0.012*** **	0.0021	0.000
LE	20.31	17.37	0.242	**0.593*** **	0.2072	0.004
CF	-0.004	0.280	0.985	0.0008	0.0033	0.805
EX	**4.27*** **	0.274	0.000	**0.006** **	0.0032	0.042
INF	0.06	0.349	0.851	-0.002	0.0041	0.498
IM	2.52	5.501	0.646	**0.709*** **	0.0656	0.000
TR	0.06	0.061	0.302	**-0.001** **	0.0007	0.039
C	-201.32**	101.77	0.047	-1.865	1.2141	0.124
R-squared	0.939			0.989		

Note: Significance level at *** p<0.01, ** p<0.05, * p<0.1

After analyzing the generalized linear model, we will now evaluate the variation of the variables in different quantiles composed of a lower, intermediate, and upper. Table 5 encompasses the outcomes of the monetary policy. Among all the quantiles, we perceive that only the lower quantile exhibited a positive significant value. Tax revenue demonstrates a positive significant impact on monetary policy across the $Q_{0.20}$ and $Q_{0.35}$. This insinuates that an increase in tax revenue of 1% expands the money supply of eastern and southern Africa by 0.16% and 0.10%. The results are divergent from the GLM table which revealed

that exportation has a significant impact on monetary policy. Because in the quantile model it is the tax revenue that displays a significant influence on the money supply.

Table 5: The Quantile Results for the Monetary Policy

Variables	Monetary Policy (MS)								
	Lower quantile			Intermediate quantile			Upper quantile		
	$Q_{0.05}$	$Q_{0.20}$	$Q_{0.35}$	$Q_{0.40}$	$Q_{0.55}$	$Q_{0.65}$	$Q_{0.70}$	$Q_{0.80}$	$Q_{0.95}$
LE	14.81	6.020	-3.539	3.108	22.97	20.75	22.82	42.87	28.35
	(55.36)	(31.81)	(30.43)	(25.71)	(20.77)	(19.46)	(44.00)	(45.42)	(35.08)
CF	-0.018	-0.033	0.020	0.00431	-0.019	-0.040	-0.0554	0.140	0.216
	(20.90)	(9.506)	(11.07)	(12.64)	(12.23)	(12.27)	(16.66)	(13.49)	(11.00)
INF	-0.220	0.0962	-0.141	-0.114	0.449	0.230	0.160	-0.136	-0.333
	(0.770)	(0.529)	(0.425)	(0.575)	(0.521)	(0.550)	(0.560)	(0.535)	(0.558)
IM	-1.883	2.803	7.107	4.883	1.166	3.014	2.724	-0.499	4.699
	(75.62)	(41.41)	(42.87)	(31.43)	(27.93)	(30.27)	(30.89)	(22.47)	(23.03)
EX	3.755	3.747	3.908	3.997	4.157	4.291	4.352	4.896	4.937
	(76.43)	(43.03)	(39.51)	(42.05)	(37.98)	(40.11)	(22.47)	(14.56)	(16.54)
INT	-0.228	0.0591	0.0678	0.139	0.245	0.212	0.183	-0.356	-0.359
	(0.402)	(0.225)	(0.247)	(0.255)	(0.246)	(0.274)	(0.306)	(0.300)	(0.300)
TR	0.198	**0.162***	**0.101***	0.0857	0.0821	0.066	0.068	0.048	0.016
	(0.120)	(0.082)	(0.058)	(0.157)	(0.115)	(0.134)	(0.063)	(0.066)	(0.064)
Constant	-100.8	-83.58	-51.27	-82.45	-211.6	-212.3	-225.6	-355.4	-291.8
	(288.1)	(182.5)	(165.0)	(169.0)	(140.2)	(143.8)	(246.8)	(256.6)	(203.4)

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 6, which denotes the results of the fiscal policy presents that importation and tax revenue have a significant effect on government expenditure. For instance, an increase in the importation of goods and services expands the government expenditure by 0.76%, 0.758%, and 0.75% ($Q_{0.40,}$ $Q_{0.55}$, and $Q_{0.65}$). Whereas, interest rate shows a negative significant impact on government expenditure across all the quantile periods. This implies that an increase in the interest rate in eastern and southern Africa reveals to decrease in the government expenditure by -0.0167% and -0.013% (lower quantile) -0.013%, -0.01, and -0.01 (intermediate quantiles) -0.010, and- 0.011 (upper quantile). The results are indistinguishably similar to the GLM which displayed that importation positively affects the fiscal policy, while interest rate and tax revenue have a negative influence.

Table 6: The Quantile Results for the Fiscal Policy

Variables	Fiscal Policy (FP)								
	Lower quantile			Intermediate quantile			Upper quantile		
	$Q_{0.05}$	$Q_{0.20}$	$Q_{0.35}$	$Q_{0.40}$	$Q_{0.55}$	$Q_{0.65}$	$Q_{0.70}$	$Q_{0.80}$	$Q_{0.95}$
LE	0.537	0.341	0.471	0.471	0.546	0.514	0.482	0.745	1.087
	(0.573)	(0.470)	(0.510)	(0.390)	(0.411)	(0.416)	(0.781)	(0.828)	(0.875)

CF	-0.002	-0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.496)	(0.474)	(0.438)	(0.370)	(0.341)	(0.351)	(0.584)	(0.595)	(0.547)
INF	-0.010	-0.010	-0.002	-0.002	0.001	0.001	0.000	0.001	0.002
	(0.015)	(0.009)	(0.009)	(0.007)	(0.005)	(0.005)	(0.009)	(0.009)	(0.009)
IM	0.732	0.766	0.766	**0.766***	**0.758****	**0.759****	0.761	0.638	0.557
	(0.618)	(0.548)	(0.535)	(0.374)	(0.279)	(0.292)	(0.928)	(0.853)	(0.819)
EX	0.004	0.003	0.006	0.0062	0.006	0.006	0.006	0.006	0.011
	(0.271)	(0.191)	(0.248)	(0.169)	(0.046)	(0.069)	(0.539)	(0.511)	(0.532)
INT	**-0.016***	**-0.011**	**-0.013***	**-0.013*****	**-0.01*****	**-0.01*****	**-0.010***	-0.010	**-0.011***
	(0.009)	(0.007)	(0.006)	(0.0040)	(0.003)	(0.002)	(0.005)	(0.006)	(0.005)
TR	-0.000	-0.001	-0.002	**-0.002****	-0.001	-0.001	-0.001	0.0001	-0.000
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
Constant	-1.522	-0.300	-1.472	-1.472	-2.043	-1.789	-1.549	-2.364	-4.321
	(4.086)	(3.154)	(3.287)	(2.563)	(2.399)	(2.428)	(4.539)	(4.771)	(4.934)

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

The diagnostic results of table 7 revealed that both models are free from heteroskedasticity with a rejection prob of 0.059 for the monetary policy and 0.559 for the fiscal policy.

Table 7: Diagnostic Results

Breusch-Pagan test for heteroskedasticity	**Prob**	**Notes**
MS as a dependent variable	0.0592	The model is free from heteroskedasticity when the money supply is considered the dependent variable.
FP as a dependent variable	0.552	The model is free from heteroskedasticity when fiscal policy is considered as the dependent variable.

Table 8 illustrates the result of normality distribution for each variable. Hence, the study used the Shapiro-Wilk Test developed by Royston (1992). The test indicates that all the factors employed in the paper are normally distributed since the prob values are insignificant and dismissed at 1%, 5%, and 10% respectively.

Table 8: The Shapiro-Wilk Test

Variable	**Obs**	**W**	**V**	**z**	**Prob>z**
MS	32	0.705	1.845	0.748	0.376
FP	32	0.817	1.077	0.746	0.340
INT	32	0.732	1.938	0.547	0.291
LE	32	0.959	1.361	0.639	0.261
CF	32	0.790	1.699	0.571	0.604
EX	32	0.889	1.718	0.573	0.244
INF	32	0.955	1.492	0.830	0.203
IM	32	0.850	1.993	0.338	0.517

TR	32	0.835	1.489	0.535	0.208

Figure 1 express the Quantile distributions of coefficients graphs for all the variables in the context of monetary policy. According to the observations, we observe that the OLS coefficients for the following variables are inside the confidence intervals: interest rate (INT), labor force (LE), capital formation (CF), inflation (IF), tax revenue (TR), and import of goods and services (IM). This illustrates that even after performing quantile regression, the results are not substantially distinct from OLS results. However, exports of good and service (EX) do not fall within the confidence intervals of the quantile. This signifies that the results are scientifically different from the OLS results.

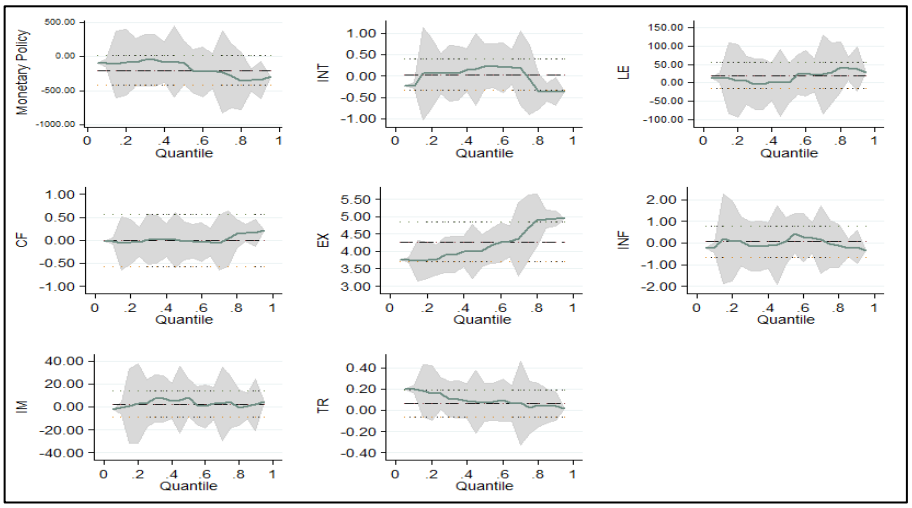

Figure 1: Monetary Policy Quantile Plot Visualization

Further Figure 2 express the Quantile distributions of coefficients graphs for all the variables in the context of fiscal policy. Based on figure 2 graphs, we perceive that the OLS coefficient for interest rate (INT), export of good and services (EX), capital formation (CF), inflation (IF), and tax revenue (TR), fall within the confidence intervals. This suggests that even after applying the quantile regression the findings are not strictly distinctive from the OLS outcomes. However, labor force (LE), and import of goods and services (IM) do not fall within the confidence intervals of the quantile. This signifies that the results are scientifically different from the OLS results.

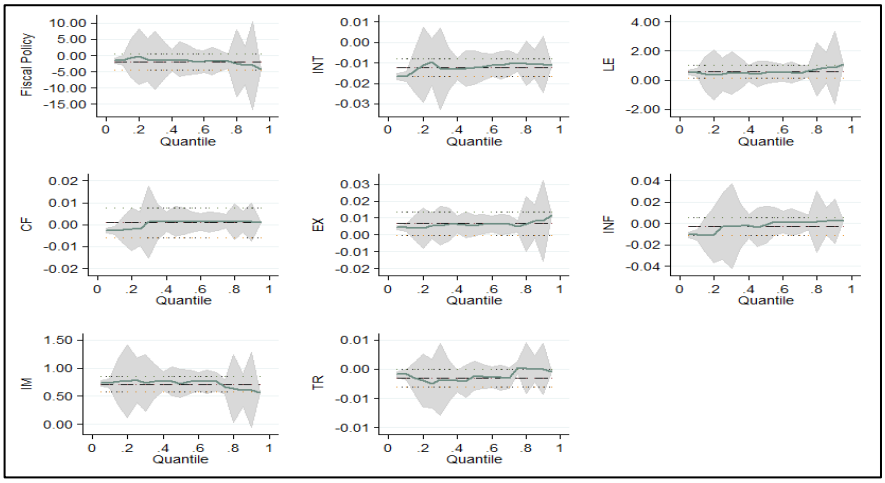

Figure 2: Fiscal Policy Quantile Plot Visualization

6. DISCUSSION

Although the Eastern and Southern Africa region has never been a topic of debate among scholars due to its slow rate of growth, the region exhibited lately a noticeable rate of economic development either nationally or internationally. Opportunities are growing as the region's economies shift. A burgeoning working class, a thriving private sector, and substantial foreign investment all contribute to a supply of resources and increased demand. Accordingly, we identified that the genesis of all these factors originates from the monetary and fiscal policies that are at the government's disposal.

Diverse public authorities that may have different goals and focus on various facets of promoting macroeconomic stability implement monetary and fiscal policies. While monetary policy is largely in charge of maintaining price levels, fiscal policy is essentially in charge of maintaining both output and debt stability. According to their objectives, the fiscal and monetary authorities implement policies, but depending on the status of the economy and their priorities, these policies can occasionally have the opposite effect. This interplay affects the macroeconomic effects of each policy. Consequently, understanding and managing macroeconomic policies depend greatly on the connection between monetary and fiscal policy.

The ultimate means by which the government expresses its agenda is through its borrowing and spending. The two types of government policy that can have an impact on the macroeconomy and capital management are monetary policy and fiscal policy, which are identified and discussed in this study. Therefore, we define the term "monetary policy" as actions taken by the central bank with the intention of affecting the amount of credit and money in an economy. Fiscal policy, on the other hand, corresponds to the choices made by the government on expenditures and taxes. Over time, economic activity is controlled by both monetary and fiscal policies. They can be utilized to either regulate development and activity when an economy begins to overheat or to stimulate growth when one starts to slow down. Furthermore, revenue and wealth redistribution can be achieved through fiscal policy.

The establishment of an environment where growth is steady and favorable and inflation is steady and controlled is often the overriding objective including both monetary and fiscal policy. It is crucial, then, to direct the foundation economy in a way that it avoids experiencing economic bubbles that might be followed by protracted times of low or declining growth and high unemployment.

As a result, the paper focused to identify the factors that determine monetary and fiscal policy in Eastern and southern Africa from the period 1990 to 2021. This study employed the broad money percentage of GDP as a proxy for the monetary policy. Whereas, general government final consumption expenditure (current US$) is considered a proxy for fiscal policy. With that in mind, the results demonstrated various outcomes. Starting with the monetary policy, we perceived that between Q0.20 and Q0.35, tax revenue shows a favorable major impact on monetary policy. This implies that a 1% increase in tax revenue leads to 0.16% and 0.10% increases in the money supply in Eastern and Southern Africa, respectively. The outcomes differ from the GLM table's findings, which indicated that exportation has a major influence on monetary policy. Next, we assessed the findings of fiscal policy and discovered that importation and tax revenue have a significant effect on government expenditure. For instance, an increase in the importation of goods and services expands the government expenditure by 0.76%, 0.758%, and 0.75% (Q0.40, Q0.55, and Q0.65). Whereas, interest rate shows a negative significant impact on government expenditure across all the quantile periods. The results closely resemble those of the GLM,

which showed that importation influences fiscal policy positively while interest rates and tax revenue negatively affect it.

The figure below demonstrates the monetary and fiscal policy levels over the last 30 years in the Eastern and Southern Africa region. Interestingly the money supply (which is considered as a monetary policy in this study) reveals stable rates across the years. This implies that the total amount of money that the region's governments supply has not changed. On the hand, we observe an evident fluctuation in the region's expenditure (fiscal policy). Starting from 1990 until 1999 the government's expenditures have not exceeded the 40%. There was a slight decline in 2000, nevertheless, the region recovered its expenditure. The figure confirms our theory that fiscal policy plays a crucial role in Eastern and Southern Africa in comparison with monetary policy.

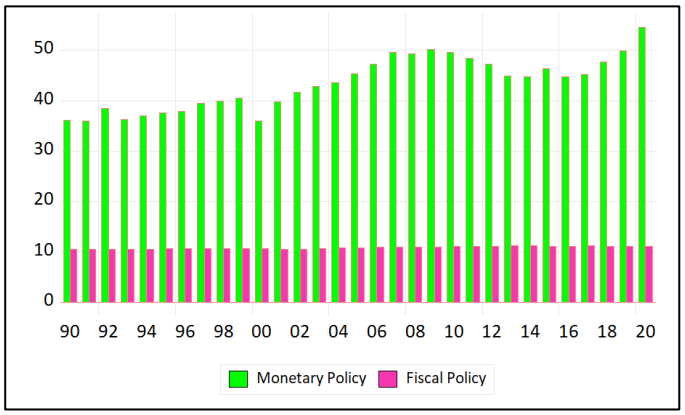

Figure 3: The Fluctuation of Monetary and Fiscal Policy over the Last Years in the Eastern and Southern Africa

CONCLUSION

An economy can be brought back to full employment by combining monetary and fiscal policy. Take a severe recession, for instance, in an economy. Engaging in an expansionary fiscal strategy to boost aggregate demand is one method that might be used. Extensive monetary policy by the central bank is another way it can contribute. However, we cannot presume that the central banks and the government would often share the same views on the economy. It is possible for these two organizations to compete with one another. As an illustration, consider a scenario where a government desires to boost spending while lowering unemployment. Consequently, it is important to identify the factors that have significant weight on these policies. That is the reason behind this paper, which is to explore the determinants of monetary and fiscal policy during the period from 1990 to 2020 by performing a quantile regression and generalized linear model on the Eastern and Southern Africa.

The study outcomes revealed that in the case of monetary policy the tax revenue and exportation presented a significant impact, whereas, in the case of fiscal policy, factors such as interest rate, labor force, exportation, importation, and tax revenue exhibited a significant influence. As a result, we note that in Eastern and Southern Africa, the macro-micro economic factors appear to be affecting mostly the fiscal policy in comparison with the monetary policy which is only affected by the exportation and tax revenue.

Hereby the following recommendation can be taken into account. First, it is important to take into account the unique institutional traits of the nations of Eastern and Southern Africa. It is well known that even in industrialized economies, rapidly and effectively raising public spending presents institutional obstacles. However, this issue is much worse in African nations. Particularly, there is a restricted ability to swiftly execute effective and well-targeted investment and social initiatives. Secondly, it would not be typically advised to lower tax rates. Reduced tax rates could be viewed as unfair because the majority of groups that pay direct taxes in many nations are relatively well-off. Additionally, these classes save more money than the less fortunate. Furthermore, the majority of Eastern and Southern African nations have low revenue ratios, which makes them more susceptible to changes in aid flows, and it has frequently been challenging to achieve progress in this area. Prolonged tax rate reductions would worsen the situation worse and stand opposition to long-term goals. Additionally, if these cuts were combined with tax breaks put in place while food and gasoline costs were high, they may result in sharp drops in income at a time when spending demands are increasing. Last but not least, given the urgent demands (Africa has a funding need for infrastructure of US$ 35 billion year), infrastructure should be the main area of investment. Improved infrastructure has been found to have the biggest beneficial effects on growth, particularly in the areas of telecommunications, energy, and roads. Advancing authorized investment projects should be prioritized. Due to limitations in implementation capabilities, new initiatives or programs should be addressed cautiously. Projects that boost employment and have a minimal import content would particularly assist domestic activity. By safeguarding operations and maintenance, which are frequently labor-intensive, the current infrastructure should be maintained.

The study advances empirical research in the area of economic development and provides evidence for decision-makers and the African community on how to manage monetary and fiscal policy in proportion to the needs of the country. Reliable findings are obtained using well-established econometric techniques. Therefore, its conclusions can be applied to other nations with comparable situations where monetary and fiscal policy clearly affect economic growth.

Statement of Research and Publication Ethics

This study has been prepared in accordance with the rules of scientific research and publication ethics.

Authors' Contribution Rates

The author's contribution to the article is 100%.

Declaration of Interest

There is no conflict of interest arising from the study from the point of view of the author or from the point of view of third parties.

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