Exploring the Determinants Influencing Somalia's Trade Balance: An ARDL Modelling Approach

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ABSTRACT

Over the past two decades, the Somali Shilling exchange rate against the US dollar and Euro currency has become unstable. The country's reliance on imports of food, fuel, building materials, and manufactured products has resulted in a chronic trade imbalance. Livestock, bananas, skins, fish, charcoal, and scrap metals are the main exports. This study offers comprehensive insights into the determinants of Somalia's trade balance, encompassing both long-term and short-term dynamics. By employing the Autoregressive Distributed Lag (ARDL) model, this research has econometrically examined the relationship between various latent variables. The findings demonstrate that exchange rates and inflation exert long-term positive and significant influences on Somalia's trade balance, yet they have short-term negative effects. Conversely, Foreign Direct Investment exhibits long-term negative effects on the trade balance but manifests short-term positive impacts. Furthermore, government expenditure displays both short-term and long-term positive and significant effects on the trade balance in Somalia. Based on the findings of the study, it is recommended that governments and policymakers implement a proactive exchange rate policy, emphasizing strategic government expenditure allocation to boost domestic production and balance trade. It urges prioritization of export-oriented industries and import-substitution sectors in Somalia. Policymakers must cautiously manage foreign direct investment to foster sustainable economic growth and trade equilibrium. This study does not control for all potential factors that could influence the relationship between the variables under investigation. To address this limitation, future research should aim to conduct a more comprehensive analysis by controlling for additional factors that may influence the relationship between the variables.

1. INTRODUCTION

Trade balance is the difference between the total value of a nation's exports and imports [1]. It is a key economic indicator that reflects the net result of a nation's international trade activities. A positive trade balance, often known as a surplus, is achieved when a country's exports of goods and services exceed its imports, contributing to economic growth. Conversely, a negative trade balance (deficit) occurs when imports exceed exports, potentially impacting a nation's financial stability and foreign exchange reserves. Understanding and managing trade balance is crucial for assessing economic health and formulating effective trade policies.

Over the last twenty years, there has been a steady rise in trade imbalances among East African nations. Uganda and Tanzania have trade imbalances of less than 20 per cent of the GDP [2]. East African nations, like many other sub-Saharan countries, rely mainly on agricultural commodity exports for their prosperity. As a result, they experience difficulty when there is a decline in commodity prices. Nevertheless, when

goods are costly, they may constitute a greater proportion of both exports and imports. Mozambique, like many other African countries, is highly reliant on commodities exports; as a result, the price of certain things has fallen, and the government has been urged to diversify the economy to revive growth [3]. The question of whether African nations' low performance may be attributed to a reliance on primary commodity exports has been addressed [4]. However, it was noted that fewer than half of the commodity prices exhibited a decreasing secular trend when compared to the price of manufactured products. Additionally, these prices have shown significant volatility, and many nations saw their GDP as reliant on exports.

Somalia, situated in the Horn of Africa, has a unique economic landscape marked by its reliance on Trade as a crucial component of its economic activity. The nation has experienced a complex history of political instability and conflicts, impacting its economic development. Understanding the determinants of trade balance in Somalia is essential for policymakers, economists, and Stakeholders aiming to enhance the country's economic stability and

sustainable growth. The trade balance is a crucial indicator reflecting a country's economic interactions with the global market. In the case of Somalia, a nation with a history of fragility and resilience, comprehending the factors influencing its trade balance is essential.

The drought of 2017 contributed to a 9% increase in Somalia's trade deficit, due to a decline in exports and an increase in imports. The percentage of GDP that was contributed by exports decreased from 15.1 per cent in 2016 to 14.5 per cent in 2017, while the percentage that was contributed by imports climbed from 61.9 per cent to 69.6 per cent. The drought was catastrophic for the export of animals. Live animal exports experienced a decline of 75% from 5.3 million animals exported in 2015 to 1.3 million in 2017. These exports constitute over 70% of the total export revenues. Additional exports, including hides and skins, oil seeds, fruits, vegetables, gums, and raisins, made a negligible contribution [5]. The 2017 drought-induced shockwaves in Somalia had far-reaching consequences on the nation's trade dynamics. Livestock, constituting over 70 per cent of export earnings, faced a precipitous decline, resulting in a substantial reduction in overall exports. Simultaneously, imports surged, exacerbating the trade deficit. This imbalance, coupled with a decline in the share of exports in GDP, poses a critical challenge to Somalia's economic resilience. Understanding the intricacies of how the drought influenced trade patterns is imperative for formulating targeted policies to mitigate such vulnerabilities in the future.

Empirical studies have extensively investigated the links between the trade balance and exchange rate in both the short-run and long-run. Chang et al. [6] explore the asymmetric impact of exchange rate changes on the trade balance. The study's findings reveal that exchange rate changes exert an asymmetric impact on the trade balance. Notably, the asymmetry of these effects transforms in response to a financial crisis. In the short run, the asymmetrical influence of exchange rates on the trade balance is observed exclusively in the post-crisis period. However, in the long run, this asymmetric effect persists across all sample periods, highlighting that only currency devaluation significantly affects the trade balance when considering the entire duration of the study. According to Igue and Ogunleye [7], the real exchange rate plays a significant role in influencing the trade balance of the country. Specifically, changes in the real exchange rate have discernible effects on the trade balance, indicating that fluctuations in the currency's value have repercussions for Nigeria's overall trade position.

Over the past two decades, the Somali Shilling exchange rate against the US dollar and Euro currency becomes unstable. The Somali shilling exchange rate varies among states due to poor central government. The nation's central bank failed to control the country's exchange rate system. Ali et al. [8], as of December 2021, 1 US Dollar is equivalent to 24000 and 40,000 shilling in southern and northern parts of Somalia respectively. After the collapse of the Somali central government back in 1990, Somalia has been wracked by societal turmoil and violence. The breakdown of governmental infrastructure, which resulted in the informal sector controlling critical economic infrastructures, is one of the post-conflict legacies. Somalia's statistics system became rudimentary, making it difficult to get high-quality economic data for planning and programming purposes. Nonetheless, as indicated by increased economic activity in construction, financial services, and telecoms, public trust in the market is

improved. The fluctuating nature of exchange rates poses a critical challenge to Somalia's trade balance, impacting the stability and sustainability of the country's economy. For decades, many developing nations, particularly those in Sub-Saharan Africa, have had trade deficits. Somalia, in particular, is an excellent illustration of one of these nations with a trade imbalance. The country's reliance on imports of food, fuel, building materials, and manufactured products has resulted in a chronic trade imbalance. Livestock, bananas, skins, fish, charcoal, and scrap metals are the main exports [9].

Some academic research has explored the impact of exchange rate on trade balance. For instance, Sharif and Ali [10] examine determinants affecting Somalia's trade balance from 1970 to 2010, a notable gap persists. This gap is underscored by the limited scope of this timeframe, which may overlook the evolving dynamics of Somalia's trade balance, particularly during subsequent unregulated periods. The dynamic nature of economic environments and the significant changes that have occurred globally and within Somalia since 2010 create an imperative for a more up-to-date analysis. It is essential to consider the temporal relevance of the study, taking into account the post-2010 period marked by rapid technological advancements, global economic shifts, and changes in international trade policies. Consequently, there is a need to bridge this gap in understanding the determinants influencing Somalia's trade balance in Somalia. This research aims to shed light on the determinants shaping Somalia's trade balance, offering insights to guide policymakers, economists, and stakeholders in formulating effective strategies for economic growth and stability. By examining the determinants influencing Somalia's trade balance, this study can offer valuable guidance to policymakers. Insights into the relationship between exchange rates, foreign direct investment (FDI), inflation, and government expenditure with trade balance can inform the formulation of targeted policies aimed at stabilizing Somalia's economy. For instance, understanding how exchange rate fluctuations impact trade balance can lead to the implementation of measures to manage currency volatility effectively. The findings of this study can provide insights into how Somalia's economy can be better managed and stabilized over time. Understanding these determinants can help policymakers and individuals make informed decisions to foster economic growth that benefits all citizens.

To attain this purpose, the research encompasses the following objectives:

1. To determine the relationship between exchange rate and trade balance;

2. To establish the relationship between FDI and trade balance;

3. To establish the relationship between inflation and trade balance;

4. To establish the relationship between government expenditure and trade balance.

2. LITERATURE REVIEW

The trade balance has been defined variously by different people. According to Rath et al. [1], trade balance is the difference between the total value of a nation's exports and imports. The trade balance is an essential economic metric that illustrates the difference in value between an economy's imports and exports during a designated time frame. It is a part of the wider current account in the balance of payments. A

positive trade balance, often known as a surplus, is achieved when a country's exports of goods and services exceed its imports, contributing to economic growth. Conversely, a negative trade balance (deficit) occurs when imports exceed exports, potentially impacting a nation's financial stability and foreign exchange reserves. The trade balance is a significant metric impacting a nation's economic health and stability.

In the case of Somalia, poverty is deeply rooted and exacerbated by continuous war, political instability, and environmental challenges. Nearly 70% of the population lives in poverty, positioning Somalia as one of the most vulnerable nations in terms of poverty levels [11]. Additionally, the COVID-19 pandemic has further intensified poverty in Somalia [12]. The socio-economic environment in Somalia is fragile, with many households struggling to access essential services such as food, healthcare, and education. These challenges are further compounded by environmental issues, particularly recurrent droughts, which hinder economic development and deepen existing inequalities. These socio-economic conditions significantly impact the country's economic performance and trade balance.

Empirical studies have extensively investigated the links between the trade balance and exchange rate in both the short-run and long-run. Chang et al. [6] explore the asymmetric impact of exchange rate changes on the trade balance. The study's findings reveal that exchange rate changes exert an asymmetric impact on the trade balance. Notably, the asymmetry of these effects transforms in response to a financial crisis. In the short run, the asymmetrical influence of exchange rates on the trade balance is observed exclusively in the post-crisis period. However, in the long run, this asymmetric effect persists across all sample periods, highlighting that only currency devaluation significantly affects the trade balance when considering the entire duration of the study. According to Igue and Ogunleye [7], the real exchange rate plays a significant role in influencing the trade balance of the country. Specifically, changes in the real exchange rate have discernible effects on the trade balance, indicating that fluctuations in the currency's value have repercussions for Nigeria's overall trade position. The study of Igue and Ogunleye [7] likely provides insights into how exchange rate policies and dynamics contribute to the trade performance of the Nigerian economy.

The results of the research conducted by Keho [13] indicate that a decline in the value of the local currency, also known as real depreciation, has a favorable influence on the trade balance in both the short run and the long run. However, the study conducted by Lotfalipour and Bazargan [14] indicate that the real effective exchange rate does not exert a statistically significant effect on the trade balance of Iran. Similarly, Alhanom [15] discovers that there is an inverse relationship between the exchange rate and the trade balance in Jordan.

Barkat et al. [16] suggest that Nominal Effective Exchange Rate (NEER), indicating currency depreciation, initially worsens the trade balance in the short run but tends to improve it over the long term. This phenomenon reflects the dynamic interplay between exchange rate fluctuations and trade balance dynamics. When considering the short-term impact of NEER depreciation on the trade balance, a deterioration is expected initially. This aligns with the concept that a weaker currency makes imports more expensive, potentially resulting in an increase in the trade deficit as import costs rise relative to export revenues. In Somalia's context, where currency

instability and fluctuation are prevalent due to factors like political instability and lack of central control over the exchange rate, this short-term deterioration in trade balance due to NEER depreciation may be particularly pronounced.

The relationship between Foreign Direct Investment (FDI) and the trade balance is another area of significant interest in economic literature. The study conducted by Anwar and Nguyen [15] utilized a gravity model to investigate the influence of Foreign Direct Investment (FDI) on exports, imports, and net exports in Vietnam during the period from 1990 to 2007. According to the empirical analysis conducted in the study, the results indicated that FDI had a positive impact on both exports and imports in Vietnam during the specified time frame. This suggests that, based on their findings, an increase in Foreign Direct Investment was associated with positive effects on both the export and import sectors in Vietnam. Positive impacts on exports could imply that FDI contributed to expanding Vietnamese goods and services sold to other countries. Similarly, positive impacts on imports could suggest that FDI led to an increase in the demand for foreign goods and services within Vietnam.

The studies conducted by various researchers [16-19] collectively suggest a consistent finding. They indicate that increased levels of Foreign Direct Investment (FDI) have a positive impact on exports. This common observation across multiple studies implies that, in the contexts examined by these researchers, higher levels of FDI are associated with increased export activity.

According to Lumayung et al. [20], Foreign Direct Investment (FDI) demonstrates a positive and statistically significant relationship with trade balance, while inflation shows a negative and statistically significant association with trade balance. The positive significance of FDI implies that increased levels of foreign direct investment tend to correspond with improvements in the trade balance. This relationship suggests that FDI inflows stimulate economic activity, potentially leading to enhanced export competitiveness, expanded production capacities, and increased export revenues. Additionally, FDI can facilitate technology transfer, skill development, and infrastructure improvements, which can further enhance a country's export capabilities and contribute to a more favorable trade balance. On the other hand, the negative significance of inflation suggests that higher inflation rates are associated with deteriorations in the trade balance. This relationship may stem from several factors. For instance, inflation erodes the purchasing power of domestic currency, making imports more expensive.

Lumayung et al. [20] highlight the positive significance of Foreign Direct Investment (FDI) and the negative significance of inflation on trade balance, are highly relevant to our study on the determinants influencing Somalia's trade balance. Firstly, the positive relationship between FDI and trade balance suggests that increasing levels of foreign direct investment can potentially contribute to improving Somalia's trade balance. As Somalia seeks to attract foreign investment to stimulate economic growth and development, understanding how FDI inflows impact trade dynamics becomes paramount. By fostering an environment conducive to foreign investment, Somalia may enhance its export capacity, diversify its economy, and reduce reliance on imports, ultimately leading to a more favorable trade balance.

However, according to the findings from Keho [13], the trade balance is greatly affected by domestic income, the real

effective exchange rate, and foreign direct investment (FDI). The research suggests that foreign direct investment (FDI) has a negative influence on the trade balance in the long run, suggesting that a rise in FDI may result in a decline in the trade balance. Additionally, A study conducted by Nga [21] revealed a negative relationship between Foreign Direct Investment (FDI) and the trade balance in Vietnam. These findings indicate that, in the context of Vietnam, a rise in foreign direct investment (FDI) might be linked to a decline in the trade balance throughout the analyzed timeframe.

Additionally, the relationship between foreign direct investment (FDI) and environmental factors, such as renewable energy consumption and environmental degradation, plays a critical role in understanding trade dynamics and economic development. A recent study by Nor et al. [22] found that FDI had both short-term and long-term negative effects on environmental degradation, while renewable energy consumption and GDP showed a negative correlation with environmental degradation. Furthermore, Nor and Mohamud [23] found a positive, statistically significant relationship between FDI, GDP, trade openness, and renewable energy consumption in the long run.

Inflation is another factor which affects the trade balance of a country. The impact of inflation on trade balance is a complex and multifaceted topic. Is this good? Scholars have explored the intricate dynamics between these two economic indicators to comprehend the potential consequences of inflation on a country's trade position.

A recent study done by Leone [24] suggests that these factors collectively influence the trade balance in the country. Notably, the study indicates that an increase of one percentage in inflation is associated with improving the trade balance.

According to Lumayung et al. [20], Foreign Direct Investment (FDI) demonstrates a positive and statistically significant relationship with trade balance, while inflation shows a negative and statistically significant association with trade balance. The negative significance of inflation suggests that higher inflation rates are associated with deteriorations in the trade balance. This relationship may stem from several factors. For instance, inflation erodes the purchasing power of domestic currency, making imports more expensive. As a result, higher inflation rates can lead to increased import costs, contributing to a widening trade deficit. Additionally, inflationary pressures may also negatively impact consumer and investor confidence, potentially leading to reduced demand for exports and dampened export revenues.

However, Sharif and Ali [10] indicate that, according to their findings, there is no significant relationship between inflation and trade balance. In other words, the study suggests that changes in inflation levels do not appear to have a meaningful impact on the trade balance in the context they examined. This lack of significance could imply that, at least within the parameters and conditions of the study, inflation does not play a statistically significant role in influencing the trade balance.

In the world of global economics, a key question is how government spending and policies influence the trade balance of a nation, which is the difference between what a country exports and what it imports. Many believe that when a government changes its spending habits, it can impact this balance. When countries have flexible exchange rates, increasing government spending on wages can lead to a drop in exports and a worsening of the trade balance. Beetsma et al. [25] emphasize that an expansion in government purchases

leads to an increase in output, consumption, and investment but also results in a reduction of the trade balance. Konstantakopoulou [26] observes that increased government expenditure leads to increased imports; Similarly, Corsetti et al. [27] observe that increased government expenditure is associated with reduced net exports.

The findings from Beetsma et al. [25], Konstantakopoulou [26] and Corsetti et al. [27] collectively underscore the significant role of government spending and policies in influencing a nation's trade balance. These studies highlight how changes in government spending habits can impact various aspects of the economy, including output, consumption, investment, and ultimately, the trade balance. In the context of our study on Somalia's trade balance determinants, these findings provide valuable insights into the potential impacts of government spending policies. Given Somalia's reliance on imports for various goods and services, including food, fuel, and manufactured products, understanding how changes in government spending may affect the trade balance is crucial. Policymakers and stakeholders must carefully consider the trade-offs associated with expansionary fiscal policies that increase government spending. While such policies may stimulate economic growth and development, they may also exacerbate trade imbalances by increasing imports and reducing exports. By integrating these findings into our study, we aim to provide a comprehensive understanding of the factors influencing Somalia's trade balance, including the role of government spending policies. This integrated approach allows us to offer actionable insights for policymakers and stakeholders to formulate effective strategies for promoting economic stability and sustainable growth while managing trade imbalances.

3. METHODOLOGY

3.1 Data source

In this research, yearly time series data for Somalia are utilised, and the study itself covers the period of time from 1990 to 2021, which results in a total of 32 observations. The study was conducted using, the World Development Indicator, SESRIC and the Food and Agriculture Organization (FAO) as its primary sources. The study used factors including trade balance (Merchandise Trade Balance) exchange rate in US dollars, GDP deflator as a measure of inflation, foreign direct investment and government expenditure.

3.2 Model specification

In this study, we utilize the Autoregressive Distributed Lag (ARDL) model for conducting an econometric analysis to explore the correlations among latent variables. Notably, the ARDL model is symmetric in terms of time series analysis, wherein both the dependent and independent variables are connected to contemporaneous as well as lagged values. Compared to traditional cointegration approaches, ARDL's currency integration approach offers many advantages. Assume that the ARDL is not integrating the variables in the same order as the study. In this sense, ARDL is applicable whether a fundamental impediment is coupled with an order I(1) or I(0) integration or both.

The ARDL model allows for the simultaneous consideration of both dependent and independent variables at

different lags, providing a symmetric treatment of time series data. This is particularly advantageous when analyzing relationships between variables that may exhibit both short-term and long-term dynamics, as it allows for the examination of contemporaneous and lagged effects.

The relationship between the dependent and explanatory variables is determined using ordinary least squares (OLS). It is important to note that the natural log was used to adjust all research variables.

$$Y = f(EXR, FDI, GDP\_DEF, GOV\_EXP) \qquad (1)$$

$$LTB_t = \beta_0 + \beta_1 LEXR_t + \beta_2 LFDI_t + \beta_3 LGDP\_DEF_t + \beta_4 GLOV\_EXP_t + \varepsilon \qquad (2)$$

LTB denotes the natural log of trade balance; *LEXR* denotes the natural log of exchange rate; *LFDI* is the natural log of Foreign direct investment; *GDP_DEF* is the natural log of GDP Deflator and *GOV_EXP* is the natural log of government expenditure.

3.3 Bounds testing procedure

Co-integration analysis can look into the relationship between two or more variables across time. In order to use the F-statistics test to examine the model's long-run relationship among variables, we rewrite Eq. (3) into ARDL form.

$$\Delta LTB_t = \alpha_0 + \beta_1 LTB_{t-1} + \beta_2 LEXR_{t-1} + \beta_3 LFDI_{t-1} + \beta_4 LGDP_{DEF_{t-1}} + \beta_5 LGOV_{EXP_{t-1}} + \sum_{i=0}^{q} \Delta\alpha_1 LTB_{t-k} + \sum_{i=0}^{p} \Delta\alpha_2 LEXR_{t-k} + + \sum_{i=0}^{p} \Delta\alpha_3 LFDI_{t-k} + \sum_{i=0}^{p} \Delta\alpha_4 LGDP\_DEF_{t-k} + \sum_{i=0}^{p} \Delta\alpha_5 LGOV\_EXP_{t-k} + \varepsilon_t \qquad (3)$$

In order to confirm the long-term relationship between the model variables, we use the two critical values provided by Pesaran et al. [28] to reject the null hypothesis if the obtained f-statistics exceeds the higher critical value. We do not reject the null hypothesis if the f-static value is less than the lower critical values, indicating no long-term cointegration among the model variables. If this is the case, however, the result will be inconclusive, and further testing will be required to prove that the variables in question are co-integrated. The error-correction term tests cointegration if a definitive solution cannot be found.

3.4 Granger causality in the error correction model (ECM) framework

After the Johansen and ARDL bound tests validate the cointegration relationship, we may employ the Granger causality in a vector error correction modelling framework. To estimate the error correction model, the error correction equation is expressed as follows:

$$\Delta LTB_t = \alpha_0 + \sum_{i=0}^{q} \Delta\beta_1 LTB_{t-k} + \sum_{i=0}^{p} \Delta\beta_2 LEXR_{t-k} + \sum_{i=0}^{p} \Delta\beta_3 LFDI_{t-k} + \sum_{i=0}^{p} \Delta\beta_4 LGD\_DEF_{t-k} + \sum_{i=0}^{p} \Delta\beta_5 LGOV\_EXP_{t-k} + \lambda ECM_{t-1} + \varepsilon_t \qquad (4)$$

Except for the error correction term (ECT), other variable definitions remain the same. To link variables short-term, the ECM must be negative and statistically significant.

4. RESULTS AND ANALYSIS OF THE ESTIMATION

This section will discuss the descriptive statistics, the stationarity unit root test, the ARDL model's long relationship through the bounds F-test, and the short and long-run coefficients, including the error correction term and the goodness of fit through diagnostics and structural stability test.

The data shown in the above Table 1 provide descriptive statistics that the trade openness had an average of 9.3, the highest and the lowest exchange rates were 9.4 and 7.8, respectively. For the LEXR variable, we found that the highest and lowest LEXR were 0.2 and -0.3, respectively, while the mean was -0.07.

In addition, FDI has an average of 1.5 and the highest and the lowest FDI of Somalia were 2.7 and -0.07, respectively. We also found that GDP deflator has an average of 1.9, and the highest and the lowest GDP deflator of Somalia were 2.2 and 1.5, respectively. For government expenditure, the highest and the lowest value of government expenditure were 8.7 and 7.7, respectively. However, the average value of URP was 8.2.

To test the stationarity of the data, augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) were employed. The results of these tests are presented in Table 2. Notably, trade openness and the GDP deflator were found to be stationary at the level, implying that these variables exhibit stability without the need for differencing. Conversely, the exchange rate, foreign direct investment (FDI), and government expenditure become stationary at the first difference. In the case of the PPP test, all variables are stationary at level except trade openness, which is stationary at first difference. Consequently, the null hypothesis is accepted, acknowledging the presence of a unit root for certain variables at the level.

To determine the optimal lag length for the cointegration analysis, we used the Akaike criterion (AIC), the Schwarz-Bayesian criterion (SBC), and the information criterion (IC). The AIC found that two lags were the most effective. Following the estimations in the bound's tests in Table 3, we calculated an F-statistic of 52.314374, which is higher than the upper bound critical value of 5.06. This means that we reject the null hypothesis and conclude that there is a cointegration relationship between the exchange rate, FDI, GDP deflator, government expenditure and trade openness.

As shown in the estimates in Table 4, the exchange rate, Foreign Direct Investment (FDI) and government expenditure have a significant positive relationship with trade balance in Somalia at a 5% level of significance. This reveals that an increase in the value of the Somali currency (exchange rate) positively influences the trade balance by making exports relatively more expensive and imports cheaper. Similarly, higher levels of FDI contribute to a more open and accessible trading environment, fostering a favorable trade balance. Moreover, increased government spending stimulates economic activity, leading to heightened demand for goods and services, which can positively impact the trade balance. These findings highlight the importance of considering factors such as exchange rate dynamics, FDI inflows, and government expenditure when formulating policies to bolster Somalia's trade performance and overall economic development. This H1, H2, and H4 are accepted.

However, the analysis showed that inflation was not statistically significant in its relationship with the trade

balance in Somalia, with a p-value of 0.5657, which is greater than the 5% significance level. This implies that while inflation is a relevant factor in the economy, it doesn't seem to directly affect or correlate with changes in the trade balance. This is because Somalia's heavy dependence on non-tradable goods or services. In other words, much of the economic activity in Somalia may revolve around sectors that are less affected by international trade dynamics. Non-tradable goods and services are those that are not easily exported or imported due to various factors such as geographical limitations, lack of

infrastructure, or regulatory constraints. This H3 is rejected.

Table 5 shows the error correction model (ECM) short-term changes. FDI and government expenditure have a positive and statistically significant short-term association with the dependent variable. However, exchange rate and inflation have a negative and significant short-term association with the dependent variable. Negative error correction is crucial. Negative (ECM-1) signifies that any difference between variables from the long-run equilibrium will be fixed by 2.50 per cent for each variable to return to it.

Table 1. Descriptive statistics

	LTB	LEXR	LFDI	LGD_DEF	LGOV_EX
Mean	9.268299	-0.072845	1.482585	1.992607	8.239927
Median	9.416377	-0.087940	1.462398	1.995416	8.230066
Maximum	9.437307	0.244813	2.671173	2.207419	8.774849
Minimum	7.853752	-0.300268	-0.677781	1.565612	7.715421
Std. Dev.	0.330977	0.148585	0.889754	0.166574	0.280818
Observations	31	31	31	31	31

Table 2. Result of unit root test

	ADF			PP		
Variables	**T-Statistics**	**Prob**	**Order**	**T-statistics**	**Prob**	**Order**
LTB	-1.8497	0.0002*	I (0)	-4.3302	0.0000***	I (0)
LEXR	-4.3758	0.0020***	I (1)	-6.8132	0.0000***	I (1)
LFDI	-6.6356	0.0000***	I (1)	-9.3289	0.0000***	I (1)
LGDP_DEF	-4.2786	0.0023***	I (0)	-4.2644	0.0024***	I (1)
LGOV_EXP	0.9732	0.9951	I (1)	-5.4065	0.0002***	I (1)

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant

Table 3. Bound cointegration ARDL long run coefficient

F-Statistic	**Signif.**	**I(0)**	**I(1)**
	10%	2.45	3.52
52.314374	5%	2.86	4.01
	2.5%	3.25	4.49
	1%	3.74	5.06

Table 4. Long –Run coefficients

Case 3: Unrestricted Constant and No Trend				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LEXR	0.054955	0.087667	0.626864	0.0058
LFDI	-0.016869	0.005220	-3.231489	0.0319
LGDP_DEF	0.236105	0.044007	5.365206	0.5657
LGOV_EX	0.273287	0.075501	3.619648	0.0224

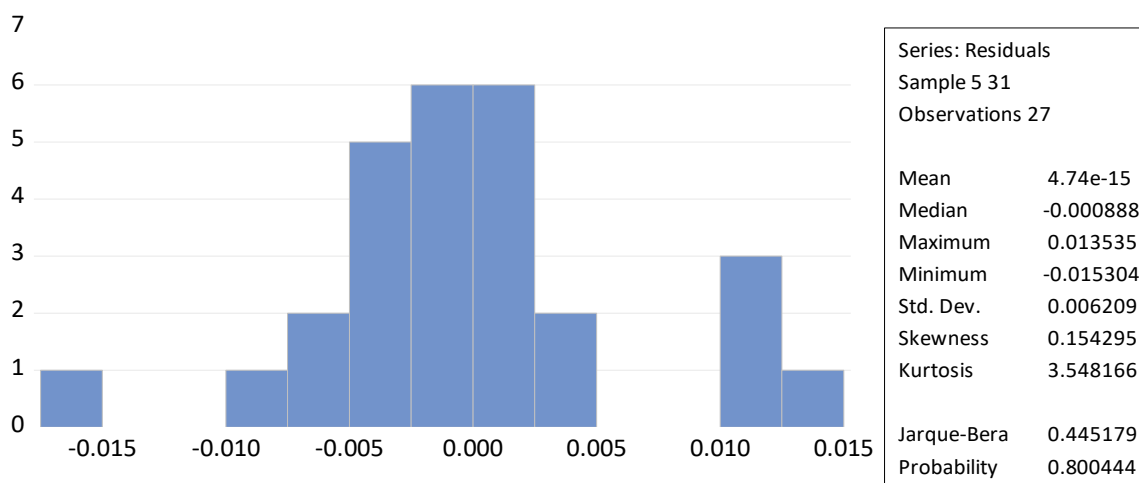| Series: Residuals	
Sample 5 31	
Observations 27	
Mean	4.74e-15
Median	-0.000888
Maximum	0.013535
Minimum	-0.015304
Std. Dev.	0.006209
Skewness	0.154295
Kurtosis	3.548166
Jarque-Bera	0.445179
Probability	0.800444

Figure 1. Normality test

Table 5. Estimation of error correction model (ECM)

ARDL Error Correction Regression
Dependent Variable: D(LTB)
Selected Model: ARDL(4, 4, 2, 4, 4)
Case 3: Unrestricted Constant and No Trend
Date: 08/29/23 Time: 22:17
Sample: 1990 2020
Included observations: 27
ECM Regression
Case 3: Unrestricted Constant and No Trend

| Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-16.85136	0.738918	-22.80545	0.0000
D(LTB(-1))	-3.732812	0.168464	-22.15798	0.0000
D(LTB(-2))	-3.023150	0.136975	-22.07080	0.0000
D(LTB(-3))	-1.463100	0.171152	-8.548524	0.0010
D(LEXR)	-0.913021	0.188399	-4.846200	0.0084
D(LEXR(-1))	0.708795	0.117435	6.035635	0.0038
D(LEXR(-2))	0.724604	0.135565	5.345047	0.0059
D(LEXR(-3))	-0.460959	0.110945	-4.154853	0.0142
D(LFDI)	-0.036679	0.005829	-6.292668	0.0033
D(LFDI(-1))	-0.024709	0.006646	-3.717736	0.0205
D(LGD_DEF)	2.007213	0.165845	12.10296	0.0003
D(LGD_DEF(-1))	-0.301584	0.120529	-2.502178	0.0666
D(LGD_DEF(-2))	-1.982782	0.155808	-12.72581	0.0002
D(LGD_DEF(-3))	-2.104792	0.191191	-11.00884	0.0004
D(LGOV_EX)	-1.719847	0.126557	-13.58945	0.0002
D(LGOV_EX(-1))	0.496037	0.112789	4.397912	0.0117
D(LGOV_EX(-2))	2.229912	0.153055	14.56939	0.0001
D(LGOV_EX(-3))	2.975511	0.227395	13.08520	0.0002
CointEq(-1)*	2.502760	0.109423	22.87234	0.0000
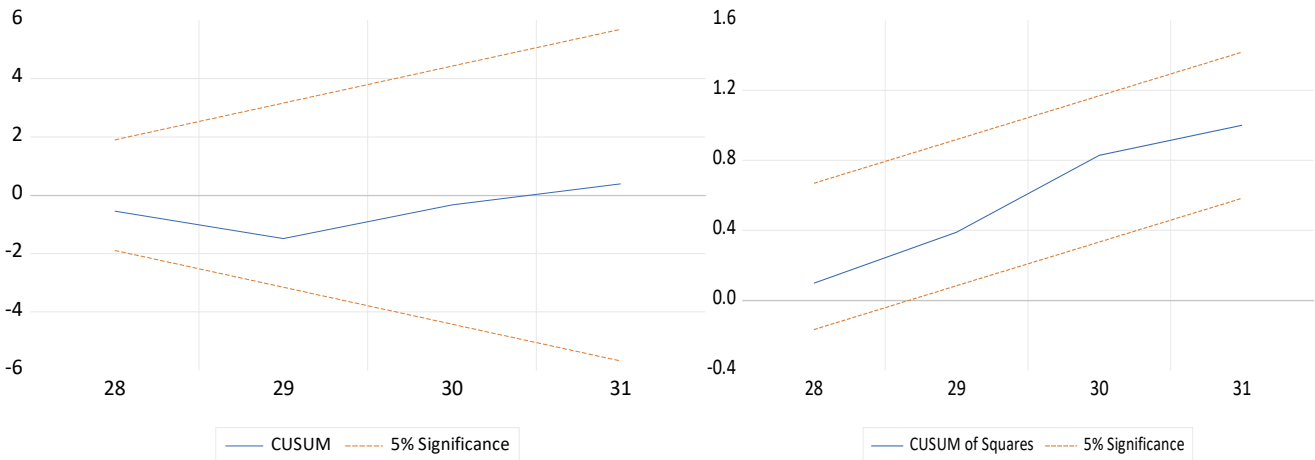
Figure 2. Stability test (CUSUM & CUSUMSQ)

The diagnostic test showed the model's residuals are normally distributed around their mean and have no heteroskedasticity, serial correlation, or multicollinearity. The error term is also normally distributed, according to the Jarque-Bera normality test. The CUSUM and CUSUMSQ tests conclude that the parameters are stable since they fall within the 95% confidence interval. See the results in Figures 1 and 2.

5. CONCLUSION

This study offers comprehensive insights into the determinants of Somalia's trade balance, encompassing both long-term and short-term dynamics. By employing the Autoregressive Distributed Lag (ARDL) model, this research has econometrically examined the relationship between various latent variables. The findings demonstrate that exchange rates and inflation exert long-term positive and significant influences on Somalia's trade balance, yet they have short-term negative effects. Conversely, Foreign Direct Investment (FDI) exhibits long-term negative effects on the trade balance but manifests short-term positive impacts. Furthermore, government expenditure displays both short-term and long-term positive and significant effects on environmental degradation in Somalia.

6. RECOMMENDATION

Over the past two decades, the Somali Shilling exchange rate against the US dollar and Euro currency becomes unstable. The country's reliance on imports of food, fuel, building materials, and manufactured products has resulted in a chronic

trade imbalance. Livestock, bananas, skins, fish, charcoal, and scrap metals are the main exports. This study provides comprehensive insights into the determinants of Somalia's trade balance, considering both long-run and short-run dynamics. In this study, we utilize an ARDL model for the econometric analysis to explore the correlations among latent variables.

The result indicates that the long-term relationship between the exchange rate and trade balance in Somalia is positive and significant at 1%. This means that when the value of the Somali currency increases (i.e., exchange rate increases), making exports more expensive and imports cheaper, it leads to a positive impact on the trade balance. In simpler terms, as the value of the Somali currency rises, it tends to improve the country's trade balance by making exports relatively more expensive and imports cheaper. Policymakers may consider these findings when formulating economic strategies. While a positive impact on the trade balance can be advantageous, there is a need for a balanced approach to ensure that the competitiveness of Somali exports is not compromised—policies addressing factors like export diversification are improving. Thus, H1 is accepted, which aligns with Igue and Ogunleye [7].

Similarly, the study found a significant positive relationship between government expenditure and trade balance in Somalia at a 5% level of significance. This suggests that increased government spending can stimulate economic activity by boosting demand for goods and services, which may lead to an increase in both exports and imports. However, if the growth in exports surpasses that of imports, it could result in a positive trade balance. In simpler terms, higher government spending tends to improve the trade balance. Policymakers should carefully consider the findings when formulating fiscal policies. Balancing government expenditure to support economic growth while avoiding excessive reliance on imports is key. Strategic investments in domestic industries and infrastructure can help maximize the positive impact on the economy and trade balance. Thus, H4 is accepted, which aligns with Beetsma et al. [25].

The analysis also revealed a significant negative and significant relationship between Foreign Direct Investment (FDI) and trade balance in Somalia at a 5% level of significance. This suggests that increases in FDI tend to correlate with a deterioration in the country's trade balance. In other words, higher levels of foreign direct investment are associated with a widening trade deficit or a reduced trade surplus in Somalia. This finding implies that despite the short-term positive effects of FDI on the trade balance, such as increased imports of capital goods or technology transfers, the long-term impacts may not be favorable for Somalia's trade position. Possible explanations for this negative relationship could include factors such as the importation of intermediate goods for production purposes, repatriation of profits by foreign investors, or a lack of sufficient export capacity to offset the increased importation associated with FDI inflows. Thus, H2 is accepted, which aligns with Dritsaki and Stiakakis [18], Kutan and Vukšić [29] and Bhatt [19].

However, the analysis showed that inflation was not statistically significant in its relationship with the trade balance in Somalia, with a p-value of 0.5657, which is greater than the 5% significance level. This implies that while inflation is a relevant factor in the economy, it doesn't seem to directly affect or correlate with changes in the trade balance. This could be attributed to the economy's heavy dependence on non-tradable goods or services. This is because of Somalia's heavy dependence on non-tradable goods or services. In other words, much of the economic activity in Somalia may revolve around sectors that are less affected by international trade dynamics. Non-tradable goods and services are those that are not easily exported or imported due to various factors such as geographical limitations, lack of infrastructure, or regulatory constraints. In practical terms, this implies that fluctuations in inflation rates within Somalia may not significantly impact its trade balance because the factors driving inflation might not directly affect the country's export and import levels. Instead, other factors such as government policies, exchange rates, foreign investment, and government expenditure may play more significant roles in influencing the trade balance. Moreover, Somalia's unique economic landscape, characterized by challenges such as political instability, limited infrastructure, and a largely informal economy, could also contribute to the lack of a clear relationship between inflation and the trade balance. Therefore, policymakers and stakeholders in Somalia may need to focus on addressing other determinants of the trade balance, such as enhancing trade facilitation measures, promoting export-oriented industries, attracting foreign investment, and improving infrastructure, rather than solely relying on inflation management to influence trade dynamics. This H3 is rejected which aligns with Sharif and Ali [10].

In comparing Somalia's economic dynamics with similar contexts, notable parallels and distinctions emerge. While countries with commodity-based economies like Nigeria or Venezuela may share similarities in the relationship between exchange rates and trade balance due to fluctuations in commodity prices, Somalia's heavy reliance on remittances and informal trade introduces unique complexities. Similarly, emerging markets like Vietnam or Bangladesh may exhibit comparable positive relationships between Foreign Direct Investment (FDI) and trade balance, yet Somalia's fragile political and security situation may influence the nature and impact of FDI inflows differently. Regarding government expenditure and trade balance, Somalia aligns with other developing countries undergoing infrastructure development initiatives such as Ethiopia or Rwanda, although its decentralized governance structure and challenges in revenue collection present distinct challenges. By recognizing these similarities and differences, policymakers can devise tailored strategies to address Somalia's specific economic circumstances and capitalize on opportunities for sustainable development.

Based on the findings of the study, it recommended that governments and policymakers should implement a proactive exchange rate management strategy that considers the impact on both exports and imports. Striking a balance to maintain competitiveness in the global market for Somali exports while ensuring affordable imports is crucial for a sustainable trade balance. This study suggests Strategically allocating government expenditure to sectors that can stimulate domestic production and contribute positively to the trade balance. Prioritize investments in industries with export potential and those that can substitute imports. Finally, policymakers in Somalia need to carefully consider the implications of FDI on the country's trade balance and develop strategies to ensure that foreign investment contributes to sustainable economic growth and a more balanced trade position over the long term. This might involve encouraging FDI in sectors that promote export-oriented production, implementing policies to enhance

domestic production capacities, and addressing structural constraints that hinder export competitiveness. While acknowledging the value of our study in understanding Somalia's trade dynamics, it is crucial to recognize its limitations. The analysis may not account for sudden external shocks or global economic events that could impact Somalia's trade dynamics. Factors such as geopolitical events, global economic downturns, or natural disasters could have unanticipated effects on the trade balance that are not considered in the study.

This study does not control for all potential factors that could influence the relationship between the variables under investigation. To address this limitation, future research should aim to conduct a more comprehensive analysis by controlling for additional factors that may influence the relationship between the variables. This could involve incorporating additional control variables into the econometric model to account for factors such as political stability, institutional quality, infrastructure development, and global economic conditions.

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