



Empirical Analysis of the Determinants of Trade Balance in Somalia

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Abstract

This paper utilizes the autoregressive distributed lag (ARDL) model, which gained popularity through the work of Pesaran and Shin (1999), to examine the determinants of trade balance in Somalia between 1970 and 2022. The main results indicate that the exchange rate, foreign direct investment, and inflation rate do not have a long-run cointegration relationship with trade balances. Still, in the short run, foreign direct investment (FDI) contributes positively to the trade balance, and an increase in the exchange rate typically results in a short-term decline in the trade balance. In the short run, inflation shows no evident correlation with trade balances. The bound test result of the computed F-statistic is less than the upper critical value at 5% of the significance level, indicating the variables don't have a long-run relationship. This study employed the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to ascertain the variables' stationary nature. The result shows the variables' mixed stationarities and the second-order difference; all variables are stationary.

Keywords

Trade balance, Exchange rate, Foreign direct investment, Inflation rate, Autoregressive Distributed Lag (ARDL)

INTRODUCTION

International trade influences prosperity, economic development, and global connectivity. One of the most important indicators of the growth of an economy is the trade balance. A country has a positive trade balance, or a trade surplus when its exports exceed its imports within a specific period. On the other hand, a country is considered to have a negative trade balance if its imports are greater than its exports over a specific time frame. Understanding the variables affecting Somalia's trade balance is crucial, especially considering the country's previous experiences with instability in politics and the economy. Somalia has a unique and complex trade profile. Although it struggles with the need to import basic needs such as food and services, the country is well-known for its booming agricultural sector, which includes the production of livestock and crops. Decades of conflict, poor infrastructure, and limited government presence influenced its trade dynamics; thus, it is an interesting case study to understand how internal and external factors affect the trade balance.

Trends in trade flows show significant institutional and political shifts punctuated by shocks and crises. Agriculture has dominated goods exports since the country's independence in 1960; by the 1970s, cattle had taken the place of bananas and other commodities. Gold has grown to be a substantial export within the past 20 years. Imports are less varied than exports. In 1990, the import mix started to shift, with a shift away from industrial imports and toward imports of consumer goods, alcohol, food, and tobacco. Somalia's neighbors who are Arabs are its principal trading partners. Colonial trade links deteriorated after independence.

Since 2000, countries in East and South Asia have been significant suppliers. Somalia's trade deficit increased after state planning was put into place and the nation experienced macroeconomic turmoil in 1970. The trade deficit has averaged more than 80% of GDP since 2015 (The World Bank, 2021). As a result, Somalia's trade balance has a complex history. Despite having a limited export market, the country nonetheless imports a lot of necessities. Knowing the variables influencing Somalia's trade balance is crucial as it impacts the country's ability to sustain economic stability and pursue further expansion. Comprehending these variables contributes to a heightened cognizance of the economic dynamics and provides policymakers, economists, and other relevant parties with crucial perspectives to formulate and implement focused economic development initiatives. It is crucial to comprehend how these factors impact the trade balance to avoid trade deficits and advance economic growth.

Somalia's trade balance averaged -1383.83 USD million from 1998 until 2022, with the highest level of -98.83 USD million in 2003 and the lowest level of -4613.16 USD million in 2021 (Trading Economics, 2023). This estimated average of Somalia's trade balance shows that Somalia's economy is experiencing a trade deficit. In general, this problem can lead to a decrease in national savings, which can ultimately cause economic loss. Although two studies related to the problem under investigation have been conducted in Somalia, they found conflicting results. The conflicting findings from the two prior studies raise questions regarding the robustness and consistency of the identified impacts of exchange rate, inflation, and foreign direct investment on the trade balance in Somalia. To address the differences and offer more definitive insights into the factors impacting the trade balance in the research area, it seems sensible to reexamine the effects of these variables on the trade balance in Somalia.

Thus, the purpose of this paper is to investigate and pinpoint the main factors that influence Somalia's trade balance. The study specifically aims to investigate the relationship between Somalia's trade balance and the foreign direct investment, inflation, and exchange rate.

Therefore, the study hypothesizes that foreign direct investment (FDI) has a positive impact on Somalia's trade balance while exchange rate and inflation hurt Somalia's trade balance. This study answers the following question: What is the effect of the exchange rate, inflation, and foreign direct investment (FDI) on the trade balance in Somalia?

LITERATURE REVIEW

Real exchange rate and Trade balance

Shahbaz et al. (2012) examined the long-run relationship between the real exchange rate and trade balance in Pakistan. Three major findings emerged from this study. First, for all periods analyzed, the evidence indicates a long-term relationship between changes in the real exchange rate and the trade balance. Second, for each of the three sample periods, the statistically significant negative elasticities imply that currency depreciation leads to a deterioration in the trade balance. Third, from 4 to 20-time horizons, the impulse response function demonstrates that a shock of one standard deviation to the real exchange rate causes a deteriorating response in the trade balance. Shahbaz et al. (2012) argue that Pakistan's substantial dependency on imports could worsen the situation if real exchange rate depreciation is utilized to improve the trade balance. An import substitution strategy could help lower reliance on imports. Efforts should be made to ensure quality control aspects of export goods aimed at restoring reputation in the international market. However, they do not address any potential limitations or alternative explanations for the findings. Additionally, their study did not provide a detailed discussion of the underlying factors or mechanisms that contribute to the negative relationship between real exchange rate changes and the trade balance. In addition, although the authors mentioned the J-curve theory, they did not delve into the specific reasons why the trade balance may initially worsen before improving.

Similarly, Mustafa et al. (2015) explored the dynamics between the Brazil-US nominal trade balance and nominal real exchange rate using monthly data from January 1999 to December 2013, and Yol and Baharumshah (2007) examined the effects of exchange rate changes on the bilateral trade balance of ten African countries vis-à-vis the US using annual data over the period 1977–2002. The two studies argue that exchange rate depreciation initially leads to a deterioration in the trade balance. However, both studies have the following limitations: Mustafa et al. (2015) mentioned the application of impulse response analysis, but they did not provide any specific findings or conclusions from this analysis. In addition, their paper stated that the J-curve shows that the currency depreciation of the Brazilian real against the US dollar may improve the trade balance, but it did not provide any evidence or analysis to support this claim. While the study of Yol and Baharumshah (2007) does not present information on the specific methodology used for the Johansen and panel cointegration tests, making it difficult to assess the reliability of the results, their paper mentioned that real exchange rate depreciation improves the trade balance in six out of ten countries, but it has not provided any further explanation or analysis for this finding.

By contrast, other studies provided empirical evidence that currency depreciation generally improves trade balances. Using the ARDL procedure, Hunegnaw and Kim (2017) investigated the influence of real exchange rates on trade balances in 10 different East African countries from 1970 to 2013. They found that real exchange depreciation significantly improves the trade balance for four countries in individual country estimations as well as in panel estimations. In addition, the elasticity of the trade balance concerning the real exchange rate is inelastic, and a significant short-run fall was not found for the trade balance, which suggests a lack of evidence for the *J*-curve relationship. In addition, Ng et al. (2008) employed unit root tests, cointegration techniques, the Engle-Granger test, impulse response analysis (IRA), and the vector error correction model (VECM) to investigate the relationship between the real exchange rate and trade balance in Malaysia from 1955 to 2006. Their empirical findings indicated that devaluation of the real effective exchange rate tends to improve the real trade balance. Both studies by Hunegnaw and Kim (2017) and Ng et al. (2008) agreed that there is a lack of evidence for the *J*-curve relationship in the short run. However, both studies have some gaps. Hunegnaw and Kim (2017) argue that real exchange rate depreciation significantly improves the trade balance for four countries, but they did not explain any specific details about these countries or the magnitude of the improvement. Their study states that the elasticity of trade balances concerning real exchange rates is inelastic, but it does not provide any empirical evidence or statistical analysis to support this claim. While Ng et al. (2008) stated that there is a long-run relationship between trade balance and exchange rate, but they do not provide any evidence or statistical analysis to support this claim. Also, they do not explain the absence of a *J*-curve effect in the case of Malaysia; therefore, their

paper lacks in-depth analysis and supporting evidence for its findings, and there are gaps in the explanation of the methodology used and the sources referenced.

Similarly, İRhan et al. (2011) used ARDL bounds testing to analyze the determinants of the Turkish trade balance. The estimation results indicate real exchange rate depreciations significantly and greatly enhance the trade balance; domestic real income negatively impacts the trade balance; and an increase in foreign real income positively impacts the trade balance. In related studies, Waliullah et al. (2010) and Kennedy (2013) examined the determinants of Pakistan's trade balance for the period 1970–2005 and Kenya's foreign trade balance for the years 1963–2012, respectively. Both studies indicated that real exchange rate depreciations had a strong and significant positive impact on the trade balance, suggesting that devaluation would lead to an improvement in the trade balance. Similarly, three studies by Nasrin (2018), Igue and Ogunleye (2014), and Keho (2020) all suggested that the real exchange rate is a significant factor in trade balance, and devaluation is likely to improve trade balance, thus consistent with the Marshall-Lerner condition. They did their studies in three different developing countries, namely Bangladesh, Nigeria, and Cote d'Ivoire. Nasrin (2018) analyzed the relationship between the exchange rate and trade balance in Bangladesh between 1973 and 2011 by using the Multivariable Ordinary Least Square Regression Model (MOLSRM). Igue and Ogunleye (2014) examined whether exchange rate depreciation has a favorable effect on Nigeria's trade balance under the Marshall-Lerner (ML) condition using the vector error correction methodology (VECM) and the Johansen method of cointegration. Keho (2020) examined the impact of foreign direct investment on trade balance: evidence from Cote d'Ivoire from 1980 to 2017, employing alternative cointegration testing and estimation methods. However, Nasrin (2018) does not address any potential endogeneity issues or other factors that may influence the relationship between the exchange rate and trade balance. Therefore, I argue that further research is needed to validate the findings of this study and to explore any additional limitations or factors that could impact the relationship between the exchange rate and trade balance in Bangladesh. Also, Keho (2020) did not discuss the potential mechanisms through which FDI adversely affects the trade balance in the long run. It would be beneficial to explore and explain these mechanisms to provide a more comprehensive understanding of the relationship between FDI and trade balance in Cote d'Ivoire. In addition, he does not provide a detailed analysis of the impact of FDI on exports and imports separately. He only focuses on the overall effect of FDI on trade balances. A more detailed analysis of the differential impact of FDI on exports and imports would enhance our understanding of the relationship between FDI and trade balance.

Furthermore, Muhammad (2010) analyzed the determinant of the balance of trade: A Case Study of Pakistan and explored the long-run as well as a short-run determinant of the trade deficit using the Johansen co-integration approach and the Error Correction Model (ECM). Also, Ray (2012) investigated the determinants of the balance of trade in India using the OLS method from 1972–73 up to 2010–11. Both authors argue that the effective real exchange rate significantly affects the trade deficit. On the other hand, Sharif & Sheik Ali (2016) and Nga (2020) found that the change in the trade balance has not been significantly influenced by the exchange rate. However, there are some holes and inconsistencies in Muhammad's (2010) argument concerning the factors considered and the shortcomings of the econometric models that were employed. On the other hand, the study by Nga (2020) did not elaborate on why the exchange rate has an insignificant contribution to the change in trade balance.

FDI and Trade Balance

Muhammad (2010) and Awan and Mukhtar (2019) suggest that foreign direct investment (FDI) significantly affects the trade deficit. Muhammad (2010) analyzed the determinant of the balance of trade: A Case Study of Pakistan and explored the long-run as well as a short-run determinant of the trade deficit using the Johansen co-integration approach and the Error Correction Model (ECM). His findings suggested that foreign income, foreign direct investment, domestic household consumption, and the real effective exchange rate significantly affect the trade deficit. Similar to using the ARDL and Error Correction Model (ECM), Awan & Mukhtar (2019) investigated the causes and impact of the trade deficit on Pakistan's economic growth for the period from 1980 to 2017. According to their findings, foreign direct investment has a positive impact on the trade deficit in the long run, but in the short run, it is insignificant. Similarly, Ray (2012) and Kennedy (2013) argue that FDI had a positive effect on the trade balance, indicating that an increase in FDI flow may motivate investors to increase domestic production and improve the trade balance.

Additionally, Kiran (2011) used the Granger and Dolado-Lütkepohl tests for causality to analyze the empirical data regarding the connection between trade (export and import) and foreign direct investment in Turkey from 1992:01 to 2008:04. Due to his test results using the bi-variate VAR model, trade and foreign direct investment do not cause one another in Turkey. His findings suggest that before attracting foreign investment, the Turkish economy should be motivated to address issues including political instability, a highly developed financial system, and a skilled labor force. However, this study by Kiran (2011) does not discuss any potential limitations or alternative explanations for the lack of causality between FDI and trade in Turkey. Also, it does not provide any insights into the implications of the findings or suggestions for future research in this area.

In contrast, Sharif and Sheikh Ali (2016) and Nga (2020) argue that foreign direct investment hurts the trade balance. Sharif and Sheikh Ali (2016) analyzed the determinants of trade balance in Somalia using the Ordinary Least Squares method (OLS), with a sample period spanning from 1970 to 2010. They found that there is only a foreign direct investment variable impacting the trade balance in Somalia. Foreign direct investment hurts the trade balance in Somalia. The other factors, including the exchange rate and inflation rate, had no impact on the trade balance in Somalia. Also,

Nga (2020) focused on the analysis of the determinants of the trade balance in Vietnam by using the ordinary least squares (OLS) technique over the period between 2005 and 2018. She found that foreign direct investment had a significant and negative effect on the trade balance. This result reflects that an increase in FDI may worsen the trade balance. The trade balance is significantly and negatively influenced by the economy's openness. Lastly, there has been no discernible impact of the exchange rate on the change in the trade balance. Similarly, Keho (2020) examined the impact of foreign direct investment on the trade balance in Cote d'Ivoire from 1980 to 2017. He suggested that foreign direct investment is an important driver of trade balance, and FDI adversely affects trade balance in the long run. However, the study by Sharif and Sheikh Ali (2016) claims to analyze the impact of foreign direct investment (FDI), exchange rate, and inflation rate on the trade balance in Somalia. However, it only finds a negative impact of FDI on the trade balance while stating that the exchange rate and inflation rate have no impact. This raises questions about the completeness of the analysis and the potential influence of other factors not considered in the study.

Inflation and Trade Balance

Harahap et al. (2023) investigated how much influence inflation and exchange rates have on the trade balance in three OIC member countries, namely Indonesia, Brunei Darussalam, and Saudi Arabia. Starting from 2012–2021, using a quantitative approach with panel data types, the results show that inflation and exchange rates have a significant effect on the trade balance in the 3 OIC member countries for the short term and the long term. The variable that more dominantly affects the trade balance both in the short and long term is inflation. A low inflation rate will not have a significant effect on the trade balance, so a low increase in inflation will still increase the balance sheet trade in three OIC member countries. The inflation rate can also cause a country not to be able to compete in world trade, so exports decline and certainly affect the surplus trade balance in the three OIC member countries. On the other hand, Sharif and Sheikh Ali (2016) suggested that the inflation rate had no impact on the trade balance in Somalia. However, the study of Harahap et al. (2023) has the following three gaps: First, the authors do not provide a detailed discussion of the results of the VECM estimation, such as the magnitude of the effects of inflation and exchange rates on the trade balance. Second, they did not discuss the potential limitations or weaknesses of the study, such as the possibility of omitted variables or endogeneity issues. Finally, they did not provide a comparison or discussion of the findings with previous studies on the topic, which could help contextualize the results.

Finally, in this literature review, I used a systematic literature review (SLR) to provide an unbiased and exhaustive summary of the existing knowledge, methodologies, findings, and gaps in the determinants of trade balance. SLR is commonly used in academic research and other areas to inform decision-making, identify trends, and guide future research.

Also, SLR helps researchers and decision-makers understand the current state of knowledge and assess the quality of existing research in a particular field. The literature sources increased my understanding of the factors that influence trade balance, such as exchange rates, FDI, and inflation, and helped me identify the potential mechanisms through which these factors affect trade balance. The source for this literature gave me awareness about the need for further research to validate the findings and explore additional limitations or factors that could impact the relationship between exchange rates, foreign direct investment, inflation, and trade balance. The literature review provides an in-depth review of existing research on the determinants of trade balance, with a particular emphasis on the effects of real exchange rates, foreign direct investment (FDI), and inflation. Insufficient evaluation of the generalizability of findings to other countries or periods is a common gap in the literature. Few studies consider the implications of their findings or provide suggestions for future research.

THEORETICAL FRAMEWORK

The concept behind this study is that the trade balance is a dynamic result that is impacted by several different economic factors. Changes in inflation, FDI, and the exchange rate are assumed to be the main causes of changes in the trade balance over time. It is suggested that variations in these variables have a significant effect on Somalia's overall trade performance. In addition, the research assumes, *ceteris paribus* (all other things being equal), that changes in the selected key variables can be linked to fluctuations in the trade balance. To determine the impacts of these variables under study, other potential influencing factors such as broad money supply, foreign income, domestic income, and government expenditure are held constant. Therefore, the study relies on concepts of trade balance dynamics, key variable significance, and economic rationality. The exchange rate changes the trade balance by making imports relatively less expensive and exports more expensive. A higher exchange rate may result in an improvement in the trade balance. As a result, there can be a rise in exports and a fall in imports, improving the trade balance. However, an excessively high exchange rate may also hurt domestic enterprises by driving down import prices, which would be bad for the trade balance. Foreign direct investment (FDI) impacts the trade balance by promoting exports through knowledge transfer, skill development, and access to foreign markets. FDI can have a positive effect on the trade balance. Moreover, FDI may reduce dependency on imports by promoting local production and swapping out imported goods with locally made ones. If inflation affects competitiveness, then it can affect trade balances. Elevated rates of inflation have the potential to diminish a nation's ability to offer competitive prices in global markets, leading to a decline in exports and an increase in imports, finally culminating in a trade imbalance. Conversely, moderate inflation rates might not have a big effect on trade.

Hypothesis

Somalia has a unique trade profile, which is different from the other countries in the world because, for the last three decades, Somalia has been experiencing a major trade deficit. Therefore, this study hypothesizes that foreign direct investment (FDI) has a positive impact on Somalia's trade balance while exchange rates and inflation hurt Somalia's trade balance.

DATA AND METHODOLOGY

Data

The study uses the data from the World Bank databases, SESRIC (statistical, economic, and social research and training center for Islamic countries), and Federal Reserve Economic Data (FRED), including the annual series data on variables such as exchange rate, inflation rate, FDI, and trade balance. To analyze this data, we will use Stata Software version 18. FDI inflow as an independent variable using data from Somalia reported by SESRIC and the World Bank from 1970 up to 2022; the exchange rate obtained from the World Bank and FRED is the value of the Somali shilling measured against the US dollar from 1970 up to 2022. Inflation represents the GDP deflator data obtained from the World Bank and SESRIC from 1970 up to 2022. The trade balance and foreign direct investment are measured in millions of USD, and all variables are applied in logarithmic form. Unit analysis of the data is country-level data because, by aggregating economic activity, trade balance analysis at the country level provides a comprehensive view of a country's overall trade performance. This paper utilizes time series secondary data that spans from 1970 to 2022 to explore the consequences of prior economic shocks and recovery, evaluate the impact of policy changes, promote statistical significance, and deepen our understanding of the factors affecting Somalia's trade balance.

Econometric Model

This paper utilizes the autoregressive distributed lag (ARDL) methodology, which gained popularity through the work of Pesaran and Shin (1999), to examine the effects of exchange rate, foreign direct investment, and inflation on trade balance in Somalia between 1970 and 2022. The short- and long-term associations between the dependent and explanatory variables are robustly and accurately determined by the ARDL technique. The ARDL approach allows us to examine the existence of both long-run and short-run relationships among the variables to provide robust results by maintaining long-run information while describing the existence of an equilibrium or relationship in terms of both short- and long-term dynamics; therefore, ARDL is extremely useful. A bound test for cointegration is conducted as well to see if the variables are cointegrated, indicating a stable long-run relationship. Additionally, to ascertain if the variables in this investigation were stationary, the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were employed. The behavior of the time series variables can be more easily described statistically and is more predictable if the variables' mean, variance, and covariance remain consistent throughout time. It is known as static behavior. The following is the specification of the autoregressive distributed lag (ARDL) model in the short- and long terms:

$$\Delta LTB_t = \alpha + \sum_{i=0}^n \beta_0 \Delta LTB_{t-1} + \sum_{i=0}^n \beta_1 \Delta LER_{t-1} + \sum_{i=0}^n \beta_2 \Delta LFDI_{t-1} + \sum_{i=0}^n \beta_3 \Delta LINF_{t-1} + \delta_1 LER_t + \delta_2 LFDI_t + \delta_3 LINF_t + \varepsilon_t \quad (1)$$

where:

LTB: Log of trade balance

LER: Log of exchange rate

LFDI: Log of foreign direct investment

LINF: Log of inflation rate

ε_t is the error term and t is time.

All variables used the logarithmic transformation to improve the interpretability, stability, and robustness of the estimated relationships between the variables. The parameters of β_0 , β_1 , β_2 and β_3 stands for the short-run dynamics of the model whereas parameters δ_1 , δ_2 , and δ_3 represent the long-run relationship.

The null hypothesis of the model is:

H0: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$ (there is no long-run relationship)

H1: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq 0$ (There is a long-run relationship).

Table 1 Description of variables

Variable	Description
Years	Years (1970-2022)
TB	Trade balance, current \$
FDI	Foreign direct investment inflows \$
INF	Inflation, GDP deflator (annual %)
ER	Real exchange rate (LCU per US\$, period average)

Table 2 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
TB	53	-1.078e+09	1.551e+09	-6.378e+09	-16857157
ER	53	10256.402	10656.558	6.281	31558.905
FDI	53	92877736	1.711e+08	-43390000	6.360e+08
INF	53	60.071	53.403	.689	161.22

Table 2 presents the descriptive statistics of the variables in this study. The number of observations included in this study is 53 from the sample of Somalia data on these variables. The dependent variable of trade balance averaged -1078000000 dollars from 1970 to 2022, with a minimum and maximum of -6378000000 and -16857157 dollars, respectively. The exchange rate averaged 10256.402 dollars, with a minimum and maximum of 6.281 and 31558.905 dollars, respectively. The foreign direct investment averaged 92877736 dollars, with a minimum and maximum of -43390000 and 636000000 dollars, respectively.

EMPIRICAL RESULTS AND DISCUSSION

Table 3 ADF unit root result

Variable	With intercept				With trend and intercept			
	Level		First-difference		Level		First difference	
	t-test	p-value	t-test	p-value	t-test	p-value	t-test	p-value
TB	-1.171	0.6858	-6.956	0.0000	-1.945	0.6308	-6.883	0.0000
ER	-1.256	0.6491	-3.347	0.0129	-0.042	0.9938	-3.447	0.0455
FDI	-1.696	0.4330	-6.897	0.0000	-2.765	0.2100	-6.855	0.0000
INF	-2.899	0.0455	-9.163	0.0000	-2.800	0.1970	-9.668	0.0000

Table 4 Philipse Perron unit root test results

Variable	With intercept				with trend and intercept			
	Level		First-difference		Level		First difference	
	t-test	p-value	t-test	p-value	t-test	p-value	t-test	p-value
TB	-1.162	0.6899	-6.956	0.0000	-2.022	0.5897	-6.879	0.0000
ER	-1.105	0.7132	-3.256	0.0169	-0.750	0.9697	-3.336	0.0605
FDI	-1.726	0.4175	-6.914	0.0000	-2.836	0.1839	-6.868	0.0000
INF	-2.881	0.0476	-9.263	0.0000	-2.729	0.2243	-10.030	0.0000

Tables 3 and 4 both present the stationarity test of the variables using the two popular methods of augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. Both the ADF and PP tests indicate that only the variable of the inflation rate is stationary at the level with and without an intercept, while all other variables are non-stationary at the level but are stationary after the first difference at 5% of the significance level, except the exchange rate in the PP test, which is significant at 10%. Therefore, the mixed stationarities of the variables and the absence of the second-order difference in this study confirmed that the autoregressive distributed lag (ARDL) method is appropriate to employ for this study.

Table 5 Bound test for cointegration

Model 1 F-statistics = 1.618		Model 2 F-statistics = 1.029	
Bound (0)	Bound(I)	Bound (0)	Bound (1)
2.72	3.77	2.72	3.77
3.23	4.35	3.23	4.35
3.69	4.89	3.69	4.89
4.29	5.61	4.29	5.61

Table 5 reports the result of the bound test to test whether the variables have long-run cointegration. The result of the bound test shows that the dependent variable and the explanatory variables do not have a stable long-run relationship between them in this study since, at the 5% level of significance, the calculated F-statistic is less than the upper critical value. The null hypothesis of the bound test is that there is no cointegration among the variables. The symmetric ARDL model 1 lag selection of (3, 3, 3, 3) and model 2 lag selection (1, 2, 1, 2) for this study are based on the Akaike Information Criterion (AIC).

As presented in the result of Table 5, there is no long-run cointegration between the variables. Therefore, Table 6 provides estimates of the parameters that characterize the response of trade balances to variations in the determining factors in the short run. Model 1 in Table 6 presents the estimates for the short-run relationship between a dependent variable and explanatory variables based on the lag selection (3,3,3,3), and it indicates that in the short run, the exchange rate and foreign direct investment have a statistically significant association with trade balance, while inflation and trade balance don't have any statistically significant association between them. The exchange rate without lag and with lag 3

have a statistically significant association with trade balance at 10% and 1% of the significance level, respectively. The findings indicate that a 1% increase in the exchange rate without lag leads to a 0.427% decrease in the trade balance and is statistically significant at 10% of the level of significance, while a 1 percent increase in the exchange rate with lag 3 results in a 0.764% increase in the trade balance and is statistically significant at 1% of the level of significance. Also, a one percent rise in foreign direct investment without lag leads to a 0.061% increase in trade balance, and it is statistically significant at 10% at the level of significance.

Table 6 Regression results

Regressors	Model (1)	Model (2)
ΔLTB_{t-1}	0.546*** (0.146)	0.870*** (0.0680)
ΔLTB_{t-2}	-0.0655 (0.179)	
ΔLTB_{t-3}	0.360** (0.148)	
LER	-0.427* (0.247)	-0.426 (0.256)
ΔLER_{t-1}	0.275 (0.467)	0.107 (0.441)
ΔLER_{t-2}	-0.609 (0.431)	0.324 (0.243)
ΔLER_{t-3}	0.764*** (0.249)	
LFDI	0.0608* (0.0359)	0.0738* (0.0376)
$\Delta LFDI_{t-1}$	-0.0370 (0.0459)	-0.0352 (0.0396)
$\Delta LFDI_{t-2}$	0.0558 (0.0466)	
$\Delta LFDI_{t-3}$	-0.0249 (0.0382)	
LINF	0.134 (0.0805)	0.0236 (0.0877)
$\Delta LINF_{t-1}$	0.00271 (0.0883)	-0.00497 (0.0939)
$\Delta LINF_{t-2}$	-0.0980 (0.0860)	-0.00848 (0.0830)
$\Delta LINF_{t-3}$	-0.0170 (0.0749)	
Constant	2.628** (1.153)	2.122* (1.154)
Observations	50	51
R-squared	0.962	0.942

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

Model 2 in Table 6 presents the estimates for the short-run relationship with lag selection (1, 2, 1, 2), which indicates that only the lag of the dependent variable of trade balance and foreign direct investments have a positive statistically significant relationship with trade balance, while exchange rate and inflation do not have a statistically significant association with trade balance. One percent increase in foreign direct investment without lag leads to a 0.074% increase in trade balance, and it is statistically significant at 10% of the level of significance. The explanatory variables are explained in models 1 and 2 by about 96.2% and 96.42%, respectively. This result is in contrast with the results of Sharif and Sheikh Ali (2016), who found that there is only a foreign direct investment variable impacting the trade balance in Somalia. Foreign direct investment hurts the trade balance in Somalia. The other factors, including the exchange rate and inflation rate, had no impact on the trade balance in Somalia. The differences between the two results may arise from the different cases, such as the different methodologies used in the two studies. For instance, their study used the OLS method, and this study used the ARDL model.

CONCLUSION

This study significantly advances the field by analyzing the short-term factors that influence Somalia's trade balance. It focuses specifically on how inflation, foreign direct investment (FDI), and exchange rate variations affect trade dynamics. By using the ARDL model, the study improves methodologically and provides insights into the short- and long-term economic issues influencing Somalia's trade balance. The study enhances the understanding of the trade dynamics in Somalia's economy by focusing on these variables within a short-term framework. The limitations of this study are the

lack of the availability and reliability of data in Somalia. The study demonstrates the importance of foreign direct investment (FDI) and exchange rate volatility in determining Somalia's short-term trade balance. While FDI contributes positively, an increase in the exchange rate typically results in a short-term decline in the trade balance. In the short run, inflation shows no evident correlation with trade balances. These findings provide important insights for policymakers and indicate potential directions for future investigation to enhance comprehension of Somalia's trade dynamics and guide focused policy measures intended to improve trade efficiency and stability. To better manage the factors influencing Somalia's trade balance the study recommends that policymakers consider implementing policies that attract and retain foreign investors, such as tax incentives, investing in critical infrastructure, reducing bureaucratic barriers, and improving legal protections for foreign investments. Adopting exchange rate policies that stabilize the currency and promoting the use of financial instruments to hedge against exchange rate fluctuations can help manage exchange rate volatility. Enhancing the capacity of national statistical agencies to collect, analyze, and disseminate reliable economic data, as well as seeking technical assistance and partnerships with international organizations, will improve data collection methodologies and reliability. Future researchers should focus on conducting longitudinal studies to assess the long-term impacts of these variables on Somalia's trade balance and investigate other macroeconomic factors, such as political stability, governance, and domestic production capacity, that might influence trade dynamics.

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DECLARATION OF CONFLICT

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