

DYNAMIC RELATIONSHIP BETWEEN EXCHANGE RATE AND TRADE BALANCE

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Abstract: *The volatility of exchange rates affects the country's export-import positions and the financial condition of organizations in the real and financial sectors. Also, it has an impact on the country's macroeconomic stability. This study analyses the dynamic relationship between exchange rates and the trade balance in five North African countries: Algeria, Tunisia, Morocco, Libya, and Mauritania. A panel autoregressive distributional-lag model (PANEL ARDL) was chosen to analyze the long-term relationship and short-term dynamics between the studied indicators. 1990-2019 was chosen as the research period. The selected variables (exchange rate level net trade balance) were tested for stationarity, and a cointegration test was performed. Three-panel dynamic models were built into the work: pooled mean group (PMG), mean group (MG), and dynamic fixed effects (DFE). The study demonstrates a long-term inverse relationship between the exchange rate level and the net trade balance for all analyzed North African countries. In particular, an increase in the exchange rate by 1 USD leads to a decrease in the trade balance deficit by 46.4 million USD for all analyzed countries together. It is found that the countries of North Africa need about three years on average to return to the equilibrium state caused by significant crises from 1990 to 2019. Individual countries (Algeria, Libya and Mauritania) have mechanisms to rebalance after approximately two and nine months, two and three months and a year and a half, respectively. However, Morocco and Tunisia do not have such mechanisms, which means that any external shock will weaken the equilibrium relationship between the analyzed variables in these two countries. To protect the trade balance from potential shocks and ensure the stability of the exchange rate, the countries of North Africa need to implement fundamental reforms in the monetary, financial and trade policies of these countries. It includes reducing imports, especially consumer goods that can be produced domestically, encouraging foreign investment and providing incentives to attract foreign capital as additional support for foreign exchange reserves.*

Keywords: exchange rate, trade balance, dynamic panel data, North Africa.

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1. Introduction

Fluctuations in exchange rates (RE) have significant repercussions on various sectors and overall economic indicators, particularly on the foreign trade sector. However, foreign trade in North African (NAF) countries stands out for being export-oriented and linked to the US dollar. Most NAF countries export raw materials such as oil, gas, minerals, and fisheries resources. Any change in the US dollar directly impacts the exchange rates of these countries and consequently their economies, given their trade budget's structural weakness characterized by deficits in most periods. Therefore, it is valid to assert that the RE plays a crucial role in the trade balance, but other determinants and relative features of each country's local economy should not be neglected.

RE is one of the most influential factors affecting the trade balance (TB) and overall balance of payments. It plays a vital role in achieving TB equilibrium. If the local currency appreciates against foreign currencies, it creates imbalances in the TB due to the impact of the RE on the country's exports and imports. An appreciation of the local currency has a positive effect on the country's imports, as the prices of those imports decrease for the residents of the local country due to the higher RE of their currency.

Therefore, the significance of this topic is highlighted by the current situation of NAF countries, where fluctuations in commodity prices due to international politics, especially the war in Ukraine and the aftermath of the COVID-19 pandemic, lead to economic instability. In response, NAF countries are adopting policies to rationalize internal spending and reduce the level of imports to mitigate potential future losses resulting from differences in exchange rates.

Based on the ongoing debate in the literature regarding the relationship between currency RE and the TB position, we are conducting a study on this relationship in the five NAF countries: Algeria, Tunisia, Morocco, Libya, and Mauritania. This will be done through addressing the following main question: To what extent does the fluctuation of the RE impact the TB position in NAF countries for the period 1990-2019? Additionally, does there exist a mechanism built upon the RE to correct imbalances in the TB of these countries in the short term? We assume, based on established economic principles, that any decrease in the currency value leads to an improvement in the TB through an increase in export levels relative to imports in the long run.

This study is organized as follows: The first section reviews relevant literature on the RE and trade balance. The second section presents the research model and estimation methods used. The third section presents and discusses the findings, followed by a general conclusion.

2. Related Studies. The most significant applied studies addressing the relationship between exchange rates and the TB in NAF countries include the following:

A study by (Mahend, Saad Nouri, & Nazim, 2023) provided an analysis of the role of exchange rates and the TB in the Iraqi economy (2004-2020) using a descriptive analytical approach. The results indicated that the RE accounts for 94% of the TB variations, with 6% influenced by external factors. Additionally, they discovered a weak positive correlation attributed to the economy's heavy reliance on oil.

Another study conducted by (Ali Ahmed & Faisal Ghazi, 2019) explored the dynamic relationship between the parallel RE of the Iraqi dinar against the US dollar and the Iraqi trade balance. The data showed overall instability, but after considering first differences, the data became stable. The tests revealed a cointegrating relationship between the RE and the trade balance, with a unidirectional causality where the RE influences the TB first, followed by the TB affecting the exchange rate.

(Andrew, 1990) Focused on the impact of exchange rates on the TB in developing countries. Using non-structural techniques, the researcher demonstrated that a real RE depreciation does not necessarily lead to a significant improvement in the trade balance. The article emphasized developing countries, implying that these findings could affect trade strategies and monetary policies in those nations. More details and supporting evidence are available in the full article.

(Vikneswaran & Wai, 2019) aimed to clarify the relationship between the Malaysian TB and various macroeconomic variables, including the exchange rate, inflation rate, money supply, and domestic income. The

study covered a period of 15 years from 2000 to 2015, and the researcher used the Autoregressive Distributed Lag (ARDL) model to examine the relationship between the study variables. The findings indicated that the exchange rate, inflation rate, and domestic income have a strong impact on the Malaysian trade balance, while the money supply does not significantly affect it.

(Sadok , 2018) tested the relationship between the RE and the TB for Morocco by examining the existence of the Marshall-Lerner condition and J-curve. The researcher employed the autoregressive method for annual time series data from the period 2000 to 2015. The study concluded that RE fluctuations do not have a significant impact on the level of foreign trade. It suggested that the value of imports and exports in Morocco depends not only on the real RE but also on several other variables, such as the global economic situation and domestic demand.

Another study by (Al-Dulaimi & Al-Dulaimi, 2019) aimed to determine the nature of the dynamic relationship between the Iraqi dinar's RE against the US dollar in the parallel market and the Iraqi trade balance. The study period spanned from 1980 to 2012, and the researchers used various tools and standard tests on the time series of the variables, including the Johansen cointegration test and Granger causality test. The results indicated the presence of a bidirectional causality and cointegration between the RE and the trade balance.

3. Variables, Model, and Estimation Methods.

3.1. Variables. Based on economic theory and previous field studies, we assume that the TB is the dependent variable, and the RE is the independent variable, following the mathematical formula:

$$TB_{it} = f(RE_{it}) \quad (1)$$

The dependent variable, Net Trade Balance (TB), is calculated as the difference between exports of goods and services and imports of goods and services (excluding services associated with previously produced factors), measured in US dollars.

The independent variable, Exchange Rate (RE), represents the official RE, which is the value of the local currency against the US dollar averaged over the period. The RE is determined by the local monetary authorities in the sample countries as the annual average based on monthly averages. In the study, "i" refers to the country, and "t" refers to the years.

The sample includes NAF countries, consisting of five countries: Algeria (DZD), Libya (LYB), Morocco (MAR), Mauritania (MOR), and Tunisia (TUN). The data source is the World Bank database, covering the period from 1990 to 2019 to mitigate the impact of the COVID-19 shock.

3.2 Model and Estimation. Our study data is of the balanced Panel type, which combines spatial and temporal dimensions into a unified series. This allows us to capture both cross-sectional and time-series characteristics simultaneously, in addition to increasing the sample size, which leads to increased degrees of freedom and improved statistical properties of the estimates (Regies & Michel , 2016).

On the other hand, there are several dynamic linear models supported by Panel data, but we will focus on three estimators:

Mean Group (MG) Estimator. Developed by (Pesaran & Smith, 1995), this estimator provides consistent estimates of the mean of Panel model components. It allows the model components, such as the intercept, short-term parameters, long-term parameters, and error terms, to vary across countries. However, one drawback of this estimator is its failure to consider the possibility of homogeneity in some model parameters across countries. To address this, (Hashem, Yongcheol, & Ron, 1999) proposed the Pooled Mean Group (PMG) estimator.

Pooled Mean Group (PMG) Estimator. Developed by (Hashem, Yongcheol, & Ron, 1997), this estimator combines the MG estimator and the traditional Pooled estimator. It takes into account the heterogeneity in short-term parameters and allows model parameters to vary by each country. PMG ensures homogeneity in the long-term relationship for all countries, making it consistent and more efficient than MG, which does not impose restrictions on long-term parameters under the assumption of homogeneity.

Dynamic Fixed Effects (DFE) Estimator. This estimator assumes homogeneity in the short-term and long-term relationship across all countries, where all regression coefficients are homogeneous except for country intercepts, which are allowed to differ across countries.

In general, the PANEL ARDL model takes the following form:

$$\Delta y_{i,t} = \phi_i EC_{i,t} + \sum_{j=0}^{q-1} \beta_{i,j} \Delta X_{i,t-j} + \sum_{j=1}^{p-1} \lambda_{i,j} \Delta y_{i,t-j} + \varepsilon_{i,t} \quad (2)$$

Where:

$$EC_{i,t} = y_{i,t-1} - X_{i,t} \theta_i \quad (3)$$

y is the dependent variable, X is the explanatory variables, EC is the error correction term, Δ denotes first differences, β and λ represent short-term and dynamic order parameters for the explanatory and dependent variables, respectively, Φ is the long-term parameters, and ε is the random error term with a zero mean and constant variance.

To build the PANEL ARDL model according to the methodology, we follow the following steps: stationarity analysis of the variables, homogeneity tests, cointegration tests, model selection, estimation of the appropriate model, and finally statistical and economic analysis.

4. Results

4.1 RE in NAF Economies. The economic activity in NAF countries during the study period of 1990-2019 witnessed varying economic developments between recession and recovery, but with a general trend towards the depreciation of local currencies in NAF countries against the US dollar.

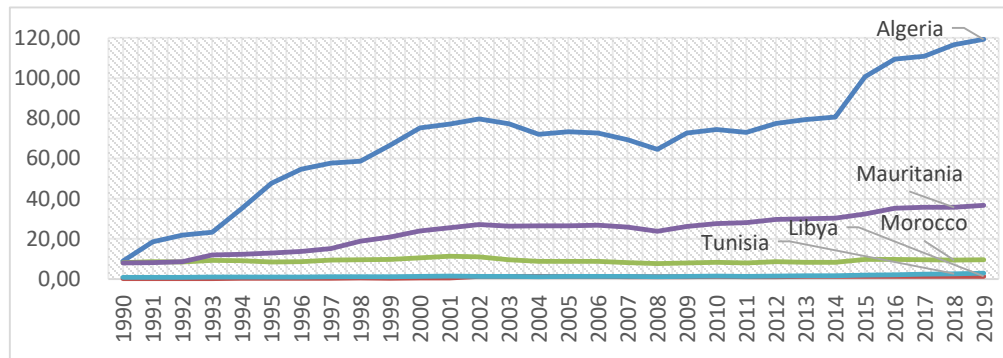


Figure 1. Evolution of the RE of NAF Countries (1990-2019)

Source: Based on World Bank Database (2022), authors made.

It is evident that the RE of local currencies in NAF countries experienced significant fluctuations during the period from 1990 to 2019. The study provides a detailed analysis for each country separately:

Algeria. The RE of the US dollar recorded an increase of 1332% against the Algerian dinar during the mentioned period, reaching its highest value in 2019 at a rate of 119.35 Algerian dinars per US dollar. This development can be traced back to the recommendations of the International Monetary Fund in the 1990s, which called for a 40.17% devaluation of the RE in 1994. The Algerian economy was affected by fluctuations in oil prices, leading to a decline in its production and price, in addition to a budget deficit that required structural financial and monetary measures to achieve monetary stability in the country.

Libya. The RE of the Libyan dinar witnessed a continuous depreciation against the US dollar since 1990, with an average annual increase of 0.94 Libyan dinars per US dollar. In 2019, the RE reached its highest level at 1.40 Libyan dinars per US dollar. The depreciation of the Libyan dinar can be attributed to the crisis in the 1980s and early 1990s, which coincided with a global decline in oil production and price, in addition to an increase in the

country's general budget ceiling. In October 2001, the Libyan monetary authorities issued a decision to raise the RE by 51%.

Morocco. The Moroccan dirham experienced slight fluctuations in the RE during the study period, with an average annual RE increase of about 9.11 Moroccan dirhams per US dollar. The dirham remained stable against the dollar at around 8 to 9 dirhams per US dollar from the late 1990s until 2019. This relative stability reflects the strength and sustainability of the Moroccan economy in the face of economic and political challenges.

Mauritania. The Mauritanian ouguiya witnessed a continuous depreciation against the US dollar during the mentioned period, with an average annual increase of 23.7 new ouguiya per US dollar. In 2019, the RE reached its highest level at 36.69 new ouguiya per US dollar. These movements can be traced back to the floating of the RE at the beginning of 1996, followed by a 106 old ouguiya increase in the RE in 2009, and the issuance of the new ouguiya in 2018.

Tunisia. The Tunisian dinar witnessed continuous depreciation against the US dollar during the study period, with a total increase of approximately 332%. In 2019, the RE reached its highest level at 2.93 Tunisian dinars per US dollar. The decline in the value of the Tunisian dinar can be attributed to imbalances in financial equilibrium and deteriorating economic conditions.

4.2 TB in NAF Economies. During the period from 1990 to 2019, the Algerian TB experienced several events with varying impacts, ranging from negative to positive. One of the main factors that affected the TB was the fluctuation in oil prices. In 2016, Algeria witnessed its largest deficit in history, reaching 22.6 billion US dollars. However, it gradually improved with a slight recovery in oil prices, resulting in a lower deficit of 11.7 billion US dollars by the end of 2019.

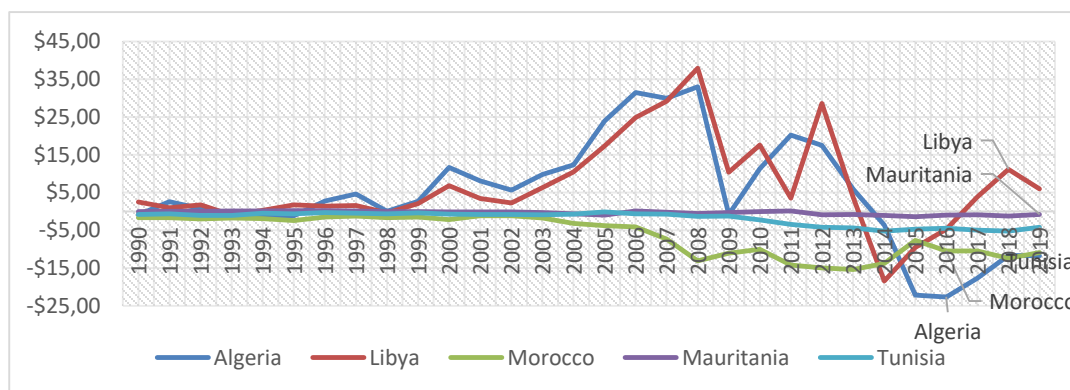


Figure 2. Evolution of the TB of NAF Countries for the Period 1990-2019

Source: Based on World Bank Database (2022), authors made.

As for the Libyan TB, it showed a slight fluctuation during the period from 1990, recording a small surplus in the first year and turning into a larger surplus after 12 years. The volatility in the surplus can be attributed to the decline in export levels due to the economic sanctions imposed on Libya during the 1990s. However, Libya experienced a prosperous period from 2003 to 2008 when oil prices increased, and its exports grew, leading to a surplus of 38 billion US dollars in 2008. But with the beginning of the decline in oil prices and the civil war in 2014, Libya's TB registered its first deficit since 1990, amounting to 18 billion US dollars, but it gradually improved starting from 2017.

As for Morocco, we noticed a continuous and chronic deficit in the TB during the study period. The deficit began in the early 1990s at a value of 1.6 billion US dollars and continued at this average until 2004, but then it deteriorated significantly to reach 13 billion US dollars by the end of 2008. This chronic deficit is attributed to the inability of Moroccan goods to compete both domestically and in foreign markets, in addition to external

factors beyond the government's control, such as the rise in global oil and food prices and the gloomy economic prospects in Europe, Morocco's main partner.

Regarding the Mauritanian TB, it experienced a significant surplus during the period from 1992 to 1997, ranging from 52 million US dollars in 1992 to 83 million US dollars in 1997. The TB situation improved in 2011, registering a surplus of 127 million US dollars, but it began to deteriorate again starting from 2015 when it recorded its largest deficit of 1.4 billion US dollars. This unfavorable situation is mainly attributed to the slower growth of exports compared to imports. Mauritanian exports mainly consist of iron ore, fishery products, and few other exports, which hardly contribute to a significant surplus. Despite the economic reform program implemented over the last two decades, the TB situation did not improve significantly.

As for Tunisia, the TB was generally characterized by a continuous and chronic deficit during the study period, with an average total deficit of 3.52 billion Tunisian dinars. In 2005, it recorded its lowest deficit at 124 million US dollars, while in 2018, it recorded its highest deficit of 5 billion US dollars.

This ongoing deficit is attributed to several reasons, including the decline in the value of the Tunisian dinar against foreign currencies, negatively affecting the competitiveness of Tunisian products in international markets. Tourism revenues also witnessed a relative decline, as did foreign direct investment inflows. The widening gap between the country's production of energy commodities, such as petroleum, and its needs also affected the TB. Furthermore, the global financial crisis of 2008 affected the Tunisian economy, leading to a decline in global demand for Tunisian goods and a decrease in exports, resulting in an increase in the trade deficit. The Libyan crisis of 2011 was also one of the main factors affecting the Tunisian TB, as Libya was an important market for Tunisian exporters, and trade between the two countries was negatively affected by this crisis.

Overall, it is observed that the TB of each country in North Africa has been influenced by several economic and political factors over the years. Fluctuations in oil prices, declining exports, increasing imports, global crises, and internal conditions of each country are all part of the challenges faced by the TB in the region. Therefore, these countries require improving their competitive capabilities and implementing economic policies and development strategies to enhance exports, reduce trade deficits, and achieve economic stability.

4.3. Results of the econometric study

4.3.1. Independence Tests. Table 1 shows the (Pesaran H. , 2015) test for independence among cross-section in Panel data. The results indicate that the p-value of the test statistic for both the TB and the RE is less than the 5% significance level. Therefore, we reject the hypothesis of independence among the countries, and thus, we conclude that there is a correlated across panel groups. This leads us to employ second-generation tests for the unit root and cointegration tests.

Table 1. Independence Test (CD 2015)

Variable	CD test	P-value
TB	6.552	0.0001
RE	9.998	0.0001

Source: Calculated by the authors using statistical software.

4.3.2. Unit Root Tests. The purpose of this test is to detect the stability of the study variables and determine their order of integration. We apply the (Pesaran H. , 2007) test to the study variables due to the existence of a relationship among the cross-sections, which is one of the most important second-generation tests.

Based on the results presented in Table 2, we observe that at the level, the computed values are less negative than the tabulated values at the 5% significance level. This means that we accept the hypothesis of the presence of unit roots for the study variables in all models (intercept, intercept and trend, without), and thus, these variables are non-stationary at the level. Therefore, we proceed to perform first-difference, and the results show that both variables are stationary and integrated at the first order, I(1), at the 5% significance level for all three statistical models.

Table 2. Unit Root Test (CIPS 2007)

	TB				RE			
	At level		In 1 st difference		At level		In 1 st difference	
	Tabulated	Calculated	Tabulated	Calculated	Tabulated	Calculated	Tabulated	Calculated
Trend	-2.25	-1.306	-2.22	-5.49	-2.25	-1.457	-2.25	-3.995
Trend and intercept	-2.94	-2.66	-2.82	-5.456	-2.82	-1.431	-2.94	-4.29
Without	-1.61	-0.624	-1.61	-5.429	-1.61	-1.406	-1.61	-3.911

Source: Calculated by the authors using statistical software.

4.3.3. Homogeneity Test. Considering the p-value of the Chi-square statistic according (Swamy, 1970), we reject the hypothesis of the heterogeneity of regression coefficients between the study variables at the 5% significance level. Consequently, the models that allow for different intercepts are the PANEL-ARDL models, which we will perform in the next section after conducting the tests of cointegration.

Table 3. Homogeneity Test (Swamy, 1970)

TB	Coefficient	Z Statistic	P-value
RE	4.66*10 ⁸	0.25	0.806

Source: Calculated by the authors using statistical software.

4.3.4. Test of Cointegration Relationship. After conducting the stationarity tests and confirming that both variables have the same order of integration, we proceed to study the cointegration relationship between them. There are several tests to detect the presence of a long-term equilibrium relationship, but we will use the robust second-generation tests that account for cross-sectional dependence, specifically the test by (Westerlund, Testing for Error Correction in Panel Data, 2007).

Table 4. Cointegration Test (Westerlund, Testing for Error Correction in Panel Data, 2007)

Statistics	Value	Z Statistic	P-value
Gt	-1.911	-0.332	0.370
Ga	-5.079	0.848	0.802
Pt	-4.786	-1.558	0.06
Pa	-5.213	-0.495	0.31

Source: Calculated by the authors using statistical software.

The four statistics presented in Table 4 indicate the absence of a cointegration relationship between the RE and the TB variables. The p-values for the statistics Global t, Partial t, and Global a, Partial a are all greater than the 5% significance level, thus accepting the hypothesis of no cointegration relationship.

4.3.5. Model Estimation. After selecting the appropriate lag order, we found that the suitable model is ARDL (1, 0) compared to other tested lag orders. This model includes one lag for the dependent variable, the TB, and no lags for the independent variable, the RE.

In this step, we compare the results obtained from the MG estimator, the PMG estimator, and the DFE estimator. Based on the results in Table 5 and after conducting the Hausman test between each pair:

MG vs PMG. We found that Prob = 0.213 > 0.05, thus accepting the hypothesis of no difference, and consequently, the appropriate model is the PMG model.

DFE vs PMG. We found that $\text{Prob} = 0.9999 > 0.05$, thus accepting the hypothesis of no difference, and consequently, the appropriate model is the PMG model.

Table 5. Comparison Tests Between the Panel ARDL Estimators

Period	Variables	Statistics	PMG	MG	DFE
Long-term	RE	Coefficient	-4.64E+07	2.90E+09	-1.95E+08
		P-value	0.0001	0.198	0.071
Short-term	ECT	Coefficient	-0.285329	-0.3059348	-0.3642658
		P-value	0.024	0.019	0.0001
	Δ RE	Coefficient	-9.88E+08	-1.48E+09	-8.74E+08
		P-value	0.563	0.468	0.0001
	Constant	Coefficient	1.83E+09	8.95E+08	2.51E+09
		P-value	0.165	0.753	0.015
Hausman test. PMG or MG			chi2 = 1.56, Prob = 0.2113		
Hausman test. PMG or DFE			chi2 = 0.0001, Prob = 0.9999		

Source: Calculated by the authors using statistical software.

We found that the appropriate model for our study, which allows for different short-term relationships and aggregates long-term relationships, is the PMG model. This is because it provided more consistent estimates based on the Hausman test. After estimating the model using this approach, we obtained the short-run and long-run parameters, as well as the error correction term (ECT), as shown in the Table 6:

Table 6. PMG for the Pooled Model

	TB	Coefficient	Std. Error	Z Statistic	P-value
Long-term	RE	-4.66E+07	1.05E+07	-4.40	0.0001
Short-term	ECT	-0.2853	0.1263	-2.26	0.024
	Δ RE	-9.88E+08	1.71E+09	-0.58	0.563
	Constant	1.83E+09	1.29E+09	1.42	0.156

Source: Calculated by the authors using statistical software.

Long-Term Relationship Analysis for the Pooled Model. The RE coefficient is statistically significant and negative. This highlights the inverse relationship between the RE and the TB for NAF countries. This finding is consistent with the literature, which suggests an inverse relationship between them. Specifically, a one-unit increase in the US dollar RE leads to a decrease in the TB by 4.64e+07 US dollars.

Short-Term Dynamic Relationship Analysis. It is observed that the ECT in Table 7 has a negative sign and is statistically significant ($P = 0.024 < 0.05$). This indicates the presence of a mechanism for short-term error correction in the aggregated NAF countries. The speed of adjustment of disequilibrium is $\lambda = -0.2853$. Therefore, the error correction model is accepted. This implies that approximately 28.5% of short-term imbalances can be corrected each year to return to the equilibrium state. Hence, it takes about three years to return to the equilibrium relationship in the presence of possible shocks that deviate the economies of NAF countries - which experienced significant crises during the study period 1990-2019 - from their equilibrium state. Consequently, the variables in the model exhibit cointegration and have a long-term equilibrium relationship.

Based on Table 7, the ECT for Algeria, Libya, and Mauritania is negative and statistically significant at a 5% significance level. This suggests a mechanism for error correction in these countries, and therefore, 35.64%, 43.03%, and 64.09% of short-term imbalances can be corrected each year to return to the equilibrium state, which takes around two years and four months, three years, and three months, respectively. As for Morocco, the ECT is positive but not statistically significant at a 5% significance level, indicating no mechanism for error correction. Meanwhile, Tunisia's ECT is positive but not statistically significant at a 5% significance level, implying an absence of error correction mechanism, indicating its deviation from the long-term equilibrium state.

Table 7. Error Correction Model for Each Country

Variables	Countries	Coefficient	T-statistic	P-value
ECT	Algeria	-0.3564625	-3.27	0.001
	Libya	-0.4303215	-2.88	0.004
	Morocco	-0.0417068	-0.67	0.501
	Mauritania	-0.6409237	-3.72	0.0001
	Tunisia	0.0427698	0.59	0.553

Source: Calculated by the authors using statistical software.

5. Conclusions and Discussion

5.1. Results Discussion. The results indicate that the RE coefficient is statistically significant and negatively signed in both the short and long term. This confirms the inverse relationship between the RE and the TB for NAF countries, which aligns with the descriptive analysis of the region. Any change (increase or decrease) in the US dollar RE against local currencies will have an opposite effect on the TB.

Additionally, we observe that a one-unit increase in the RE in the short term leads to an average decrease of \$988 million in the TB. This can be attributed to the crises experienced by NAF countries, such as the decline in oil prices and the black decade in Algeria, which resulted in economic downturns. These factors affected neighboring countries, leading to a deterioration in their foreign currency reserves. However, with the improvement in oil prices, stability in the region's security situation, and the implementation of diverse RE control measures, general price stability has been observed since the beginning of the third millennium.

Nonetheless, with the onset of the global financial crisis in 2008 and the beginning of movements known as the Arab Spring starting from 2012, leading to security and political instability in the region, followed by a significant drop in oil prices in 2014, all these conditions have resulted in a deterioration of exchange rates for local currencies against the US dollar, coupled with a deterioration in the TB for NAF countries.

Thus, we can conclude that the relationship between the RE and the TB in NAF economies is not mechanistic, but subject to several factors as mentioned earlier. However, overall, the relationship between them is inverse, providing valuable insights into the economic decision-making of these countries.

5.2. Recommendations. Based on the findings, we suggest the following to fortify the TB against potential shocks and stabilize exchange rates for NAF countries:

Urgent reforms in the monetary, financial, and trade systems to align with global financial and banking systems, enhancing the ability to deal with evolving economic challenges. NAF countries should work towards achieving self-sufficiency in the production of consumable goods that can be domestically produced, reducing import volumes, and improving the TB. Supporting the private sector and encouraging foreign investments should be at the forefront of economic policies, as these steps can contribute to economic growth and improve the TB. To mitigate the negative effects of potential economic shocks, NAF countries can implement flexible RE controls, meaning intervention by relevant authorities to stabilize or improve the value of local currencies. Economic diversification and reliance on diverse income sources will help reduce the impact of fluctuations in oil prices and improve the TB in the long term. To ensure currency stability and avoid depreciation, governments in North Africa must adopt sustainable economic measures and policies that lead to improved financial and monetary conditions for the country.

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