An Empirical Analysis of The Impact of the Exchange Rate on Exports: A Case Study of Mauritania

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Abstract

The export of a country is one of the main factors indicating its economic health. This study examines the impact of the exchange rate fluctuations on exports in the case of Mauritania by using annual time series data from 1981 to 2017. The Secondary data is taken from the Central Bank of Mauritania and the World Bank Data (WBD). The study uses the Augmented Dickey-Fuller (ADF) test to check the stationarity of the data, Auto Regressive Distributive lag, and Error correction Models to check the long and short-run relationship among the variables. Results of the study show that the exchange rate has a positive and significant impact on Mauritania's exports and that gross domestic product has an impact and can determine the exchange rate. The policy implication based on the findings of the study is that high variability in the exchange rate has a high impact on exports. This indicates that the exchange rate is one of many options for accelerating and determining the trade balance, considering recommendations by Enhancing Structural Reforms to Improve Economic Flexibility, Adjusting Trade Policies to Mitigate the Negative Effects of Exchange Rate Volatility, and Implement Exchange Rate Stabilization Measures.

1. Introduction

The dynamics of currency rates and exports become more obvious worldwide. This paper intends to contribute by focusing on the situation in Mauritania, applying rigorous econometric approaches such

as unit root test and ARDL (Auto Regressive Distributive Lag) to examine and estimate the effects of exchange rate on the exports, by using a yearly time series from 1981 to 2017. Exchange rates play a crucial role in determining a country's exports. Fluctuations in exchange rates can either boost or hinder a nation's exports, thus affecting its overall economic health. In the case of Mauritania, understanding the dynamics of exchange rates and their impact on exports is essential for policymakers, businesses, and international investors. By analyzing historical trends, policy interventions, and the broader economic context, valuable insights can be gained to guide decision-making and promote sustainable economic growth. Insufficient diversity is harmful to Mauritania's economy. In terms of dependence on natural resources, the nation ranked eighth in the globe, surpassing all its neighboring countries with abundant natural resources. Nonetheless, the control of extractive rents had minimal effect in promoting economic diversification and assisting in the creation of jobs led by the private sector. Almost no manufacturing exports were exported in 1997; instead, 97.6% of merchandise exports were made up of mining and seafood merchandise. Two decades later, this situation has not changed because these sectors accounted for 98.1 percent of all exports in 2017 (Memorandum, C. E. 2020). The ratio of total public debt to GDP has decreased over the last few years and stands at 48.6% in 2023. The external debt/GDP ratio recorded a regular decline from 2015 to 2019, after a strong increase in 2015 when Saudi Arabia lent $300 million to the central bank of Mauritania to help the country face the risks linked to the terms of trade shock from 2014 to 2015.

However, in 2020, the trend toward decline has stopped, reflecting increased funding to help Mauritania mitigate the impact of the COVID-19 pandemic. The external public debt continued to increase downward trend, reaching 41.3% of GDP in 2022 and rising in 2023 to 42.3% of GDP due to exchange rate depreciation at the end of 2023. The domestic debt, which had increased considerably in 2018 when the government officially recognized a debt of around 6% of GDP to the BCM, decreased from 6.6% in 2021 to around 6.3% of GDP in 2023 (World Bank, 2020). The nation's structure for policy did not encourage the development of competitive, intensive labor industries, and natural resources were not put to use to fund investments in industry. In addition to producing few new jobs, a lack of diversification left the economy vulnerable to external risks. This became apparent following the conclusion of the commodity super cycle in 2014, when GDP growth fell from 5.5 percent in 2011 to 2014 to 2.5 percent from 2015 to 2018, thus classifying Mauritania as a backslider Sub-Saharan African country.

Diversifying the economy is, therefore, an important strategic section of the national development plan (Memorandum, C. E. 2020). The study of how exchange rates affect export performance is crucial for developing countries like Mauritania. Exchange rates, which determine the value of one currency compared to another, significantly impact a nation's trade dynamics. For countries heavily relying on exports, comprehending this relationship is vital for planning and policymaking. Mauritania's economy

is greatly influenced by its export industry, which includes commodities such as iron ore and fish. Therefore, fluctuations in exchange rates can have implications for the country's stability and progress. Studies show that changes in exchange rates can greatly influence trade outcomes. For instance, Bahmani Oskooee (1986) investigated what influences trade flows in developing nations. The research highlighted how exchange rate fluctuations could create uncertainty for exporters potentially disrupting trade performance and economic development. In a related study, Dognalar (2002) analyzed how exchange rate volatility impacts exports in countries revealing that unstable exchange rates often have effects on export performance. This supports the understanding that having stable exchange rates is essential for creating a favorable trading environment and ensuring continuous export growth. The connection between exchange rates and exports is complex, especially when considering the J effect. This phenomenon, extensively researched by (Bahmani Oskooee and Ratha 2004) suggests that depreciation in a country's currency could initially worsen its trade balance before leading to improvements. Additionally, the research by Haseeb and Ghulam (2014) on exchange rate instability and sectorial exports in Pakistan sheds light on how exchange rate movements can impact export sectors in developing economies. Their findings demonstrate that different sectors may react diversely to changes in exchange rates offering insights into how Mauritania's varied export sectors could be influenced by foreign currency fluctuations. In essence, this study delves into the link between exchange rate variations and Mauritania's export performance. By leveraging insights from existing studies, it aims to deepen our understanding of how shifts in exchange rates affect export outcomes and guide policy actions aimed at making stability and growth in Mauritania.

Is there a relationship between Exchange rate and export in the short run and/or the long run? Does the official exchange rate fluctuation impact the export of goods and services in Mauritania?

1.1 Background of exchange rate and the export in Mauritania

As shown in **Figure 1,** the exports reached 3.42 billion US dollars in 2019, compared to 3.35 billion in the preceding year. The average export value in Mauritania is estimated at 1.02 billion USD between 1960 and 2022. The latest data marks a historical peak, with exports hitting an all-time high in the year 2021. Conversely, the lowest recorded export value was 3.92 billion in the year 2003.

The Central Bank of Mauritania broadened its foreign exchange interventions to cover account transactions in 2022, thus resulting in a change in its rationing policy.

Figure 1 : Export from 1960 to 2022 in Mauritania.
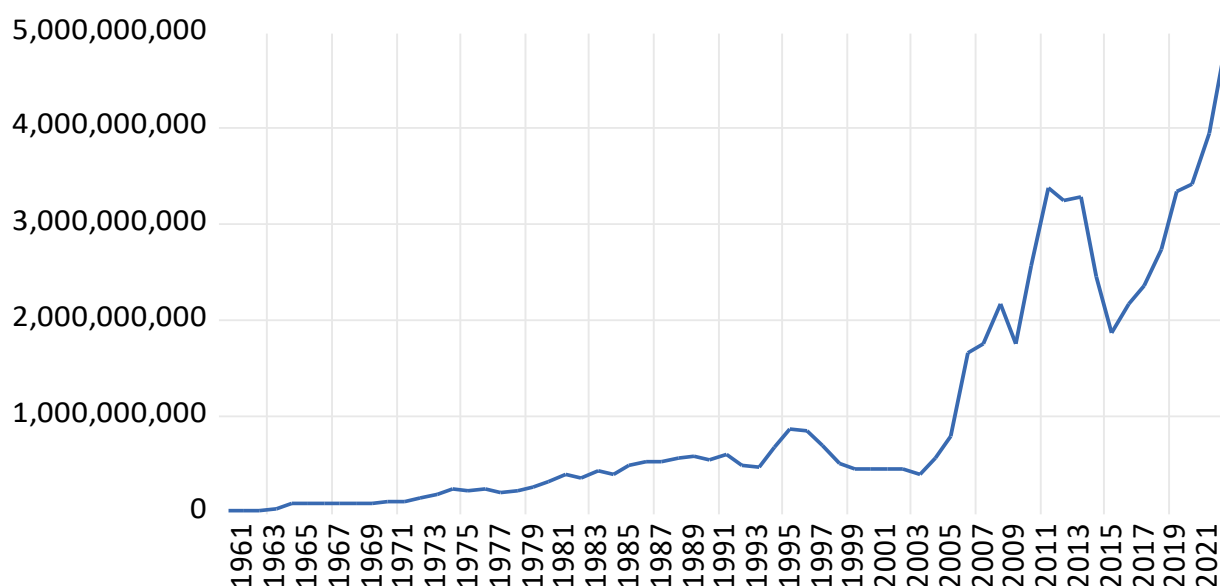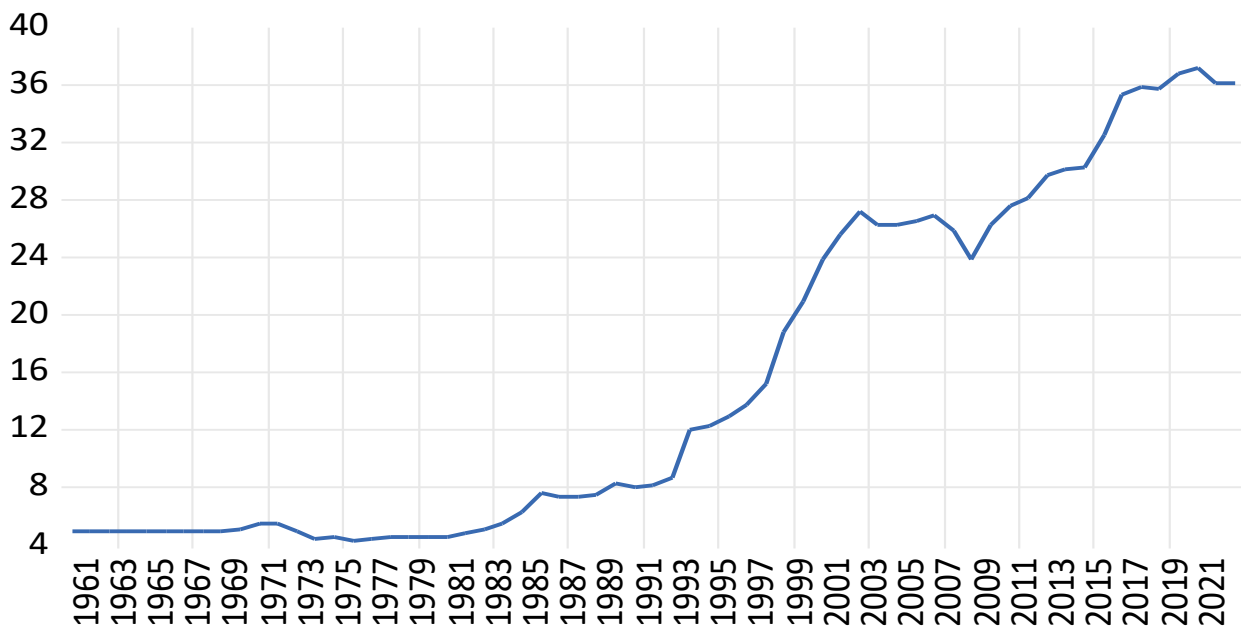

Source: Author calculation by E-views 12

The average rate stands at 15.6%, reaching a peak of 36.06% in 2022 and the lowest point of 4.31% back in 1975 as indicated in **Figure 2**. From 1981 to 2017, Mauritania went through changes in its exchange rate system to stabilize its economy and deal with economic challenges. These reforms involved making policy shifts and adjusting exchange rates. In the mid-1980s, Mauritania kept its currency, the ouguiya (MRO), tied to the franc (FCA). However, this led to difficulties due to fluctuating markets and economic conditions; thus, leading to the need for adjustments. The International Monetary Fund (IMF), (1992), noted that the initial exchange rate policies during this time aimed for stability but required interventions to tackle emerging issues. A notable shift occurred in 1992 when Mauritania carried out devaluation as part of economic reforms supported by the IMF. This devaluation of around 27% against the US dollar aimed to stabilize the economy. These reforms were part of a program focusing on adjustments meant to strengthen the country's resilience and to enhance its international competitiveness. In 1998, Mauritania moved towards a managed floating exchange rate system. This change allowed the currency to fluctuate within a controlled range based on market conditions while still involving government intervention to prevent volatility.

This strategy was developed to offer adaptability and responsiveness, to changes as mentioned by the (World Bank, 1999). In 2004 there was another adjustment made to stabilize the economy aiming to address an overvaluation issue and enhance competitiveness. The International Monetary Fund highlighted in 2005 that this step was crucial for tackling challenges and bringing the exchange rate in line with market conditions. By 2011 there was a relaxation of the exchange rate policy to allow for increased flexibility. This reform sought to strengthen the country's economic health and facilitate

adjustments during times of external pressures. The Central Bank of Mauritania emphasized in 2012 that this shift in policy played a role in improving stability and fostering growth.

Although slightly outside the timeframe, it is important to mention that in 2018, Mauritania introduced a currency unit where one new ouguiya (MRU) equaled ten old ouguiyas (MRO). This change was part of a strategy aimed at modernizing the economy and enhancing monetary management practices (as outlined by the Central Bank of Mauritania, 2018).

Figure 2 : Exchange rate from 1960 to 2022 in Mauritania

Source: Author calculation by E-views 12

1. 2 Main trading partners of Mauritania

The National Agency for Statistics, Demographic and Economic Analysis (2024) reported that Asia emerged as the leading trade partner in the second quarter, accounting for 28% of external trade. Trade activities are predominantly directed towards China (80%) and Japan (5%). Europe, capturing 26% of trade during the second quarter of 2024, remains the second-largest trade partner. The key European partners of Mauritania include Spain (27%), France (21%), Belgium (20%), and Germany (9%), thus collectively making up 77% of Mauritania's European trade. The American continent represents 21% of the total trade value, with the primary partners being Canada (78%), Brazil (13.2%), and the United States (8.1%). Africa accounts for 15% of the trade exchanges, primarily with Nigeria (36%), Algeria (13.8%), Morocco (11.5%), and Côte d'Ivoire (6.7%). The Middle East accounts for 9% of trade in the second quarter of 2024, with the United Arab Emirates constituting over 98% of trade with this region.

Trade between the Arab Maghreb Union (UMA) and Mauritania represents 4% of the total quarterly trade, comprising 26% of trade with Africa. Meanwhile, the Economic Community of West African States (ECOWAS) accounts for 51% of Mauritania's trade with Africa and 8% of the total quarterly trade. Mauritania holds a trade surplus of 1,061 million MRU with ECOWAS and a trade deficit of 1,485 million MRU with UMA. In the quarter exports, to countries accounted for 3% of the total exports and 20% of all exports to African nations, these exports experienced a drop of 46%, from the quarter.

2.   Literature Review

The connection between exchange rates and export performance holds importance for developed and developing economies. With no significant exports of manufactured goods, Mauritania's exports of goods remain primarily centered on extractives and fish goods. This review analyses into research studies that delve into this correlation between the exchange rate, exportations, and other economics aggregates particularly focusing on those similar studies utilizing the ARDL (Auto Regressive Distributed Lag) model and other models.

The study of Ahmad, Ali, and Hussain (2021) delves into how the relationship, between exchange rates and Pakistani exports explored using the Auto Regressive Distributed Lag (ARDL) model. By examining data from the State Bank of Pakistan and World Development Indicators, it was found that fluctuations in exchange rates do not significantly impact exports. In particular, an increase in the exchange rate seems to have an impact on Pakistan's trade balance. Engle and Grangers' pioneering work in 1987 on cointegration and error correction models establishes a framework for studying enduring connections among variables. Their methodology sheds light on how changes in exchange rates can impact exports over time.

Bahmani Oskooee (1986) researched the factors influencing trade flows by highlighting the role of exchange rate volatility in trade. His discoveries reveal that unstable exchange rates can create uncertainty for exporters impacting their investments and competitiveness. For Mauritania, these insights imply that maintaining exchange rate stability is crucial for supporting export performance. Bahmani Oskooee and Ratha (2004) examined the J effect, which suggests that while currency depreciations may initially worsen a country's trade balance, they can lead to improvements in the long run. This concept is important for understanding how Mauritania's export sector may react to changes in exchange rates. Although their study did not utilize the ARDL model, the J Curve theory offers context for examining the impacts of exchange rate fluctuations.

Narayan and Narayan (2004) presented findings from Fiji that support the J effect demonstrating that currency depreciation might initially deteriorate the trade balance but will eventually enhance it. This

discovery is pertinent to Mauritania indicating that while short-term challenges due to exchange rate fluctuations may arise, long-term advantages are possible.

The research highlights the importance of considering both lasting effects when assessing exchange rate policies. In the study of Pesaran, Shin and Smith (2001) introduced the ARDL model to examine the dynamics, between variables in both long terms. Their approach is especially valuable for exploring how exchange rates impact exports handling variables of orders and small sample sizes. In the context of Mauritania using the ARDL method allows for an understanding of how changes in exchange rates influence exports over timeframes. Khan and Sajjids 2005 study applied the ARDL model to investigate how exchange rates affect dynamics in Pakistan. Their research emphasized the impact of exchange rate fluctuations on trade performance showcasing the ARDL model's ability to capture short term and long-term dynamics effectively. This methodology can offer insights into how variations in exchange rates influence export performance in Mauritania.

Dognalar (2002) utilized cointegration techniques to analyze how exchange rate volatility affects exports in nations. While Dognalar did not utilize the ARDL model, his study shed light on the enduring impacts of exchange rate volatility on export performance. The insights mentioned above add to the ARDL approach by emphasizing the significance of maintaining exchange rate stability to increase export growth.

In a study conducted by Medhora (1990) within the West African Monetary Union, the effects of exchange rate variability on trade were explored. The research revealed that fluctuations in exchange rates have an impact on trade flows, thus, underscoring the necessity of exchange rates in sustaining trade relationships and promoting export growth. This study underscores the importance of management of exchange rates for Mauritania. Hooper and Kohlhagen (1978) delved into how exchange rate uncertainty influences trade prices and volumes. Their findings suggest that heightened uncertainty results in increased prices and reduced trade volumes. This research holds relevance for Mauritania as maintaining exchange rates can improve export performance by minimizing uncertainty and fostering trading conditions.

Using the ARDL model, Haseeb and Ghulam (2014) analyzed the effects of exchange rate instability on exports in Pakistan. Their study revealed that different sectors respond diversely to fluctuations in exchange rates offering a nuanced perspective on how instability impacts segments of an economy. Such sector-specific analysis is instrumental in understanding how different export sectors in Mauritania might respond to changes in exchange rates. The research of Sweidan (2013) explores the impact of fluctuating exchange rates on both exports and imports in Jordan. The findings reveal that changes in

exchange rates significantly influence the flow of trade. To be specific, when a currency depreciates it tends to boost exports as it makes Jordanian products more affordable for purchasers; conversely appreciation can lead to reduced exports and increased imports. The study underscores the importance of managing exchange rates to shape trade balance. In a study conducted by Yusoff (2010), the author explores how fluctuations in the exchange rate can impact both trade balance and domestic output in Malaysia. The research reveals that changes in the exchange rate affect both trade balance and domestic output. Specifically, when the real exchange rate depreciates, it tends to improve the trade balance by increasing exports while appreciation can lead to the outcome. These results highlight the importance of managing the exchange rate to influence trade outcomes and domestic economic performance. It is suggested that policy interventions take into account these dynamics to promote stability.

Rajković, Bjelić, Jaćimović, and Verbič (2020) discovered that changes in exchange rates have an influence on trade imbalances in EU member states and Western Balkan countries during times of economic downturns. Their research indicates that although fluctuations in exchange rates impact trade balance, the extent of this impact varies among nations. They emphasize that adjusting exchange rates alone is not sufficient to address trade imbalances and emphasize the importance of implementing strategies. Onafowora (2003) scrutinized the relationship between exchange rates and trade balance in East Asia examining whether the J Curve effect is observable, in the region.   The research indicates that changes in exchange rates do affect trade balances, thus backing the relevance of the J Curve theory. This study implies that Mauritania may experience trends highlighting the importance of understanding how exchange rate shifts impact trade balances over time. In a study by Edwards (1987), an examination of exchange rate variability in developing nations emphasized the challenges brought by currency fluctuations on trade outcomes.

The study on how exchange rates impact export performance highlights both similarities and differences in methodology. One common approach is the use of the ARDL (Auto Regressive Distributed Lag) model. Studies by Ahmad, Ali and Hussain (2021), Khan and Sajjid (2005), and Haseeb and Ghulam (2014), all utilize the ARDL model to examine how changes in exchange rates influence exports over time frames. Ahmad, Ali and Hussain (2021) and Haseeb and Ghulam (2014) concentrate on Pakistan specifically whereas Pesaran, Shin and Smith (2001) offer a perspective on utilizing the ARDL model. This broader view includes enhancements in implementing the model to address challenges like sample sizes and variable orders. Additionally, Engle and Grangers' (1987) work on cointegration provides a basis for studying enduring relationships between exchange rates and exports that complements the insights offered by the ARDL model.

Dognalar (2002) further expands on this concept by using cointegration techniques to explore how exchange rate volatility affects trade performance in the run. Haseeb and Ghulam (2014) offer an analysis of different sectors showcasing how each sector reacts to fluctuations in exchange rates. This specialized approach contrasts with studies such as those conducted by Ahmad, Ali and Hussain (2021) and Bahmani Oskooee (1986) which discuss overall trade impacts without delving into sector-specific reactions. Additionally, the regional context of the studies also sets them apart. Sweidan (2013) investigates Jordan's situation while Yusoff (2010) focuses on Malaysia providing insights into how trade balances were affected by exchange rate fluctuations in these regions. Although these findings present viewpoints they may not directly align with Mauritania's unique economic circumstances.

Both Bahmani Oskooee (1986) and Hooper and Kohlhagen (1978) emphasize that unstable exchange rates can have an effect on trade by introducing uncertainty for exporters. This observation reinforces the agreement that stable exchange rates positively impact export performance a factor, for Mauritania's export industry. Furthermore, the J Curve phenomenon, as explained by Bahmani Oskooee and Ratha (2004) and Narayan and Narayan (2004), illustrates that currency devaluations may initially exacerbate the trade balance but could result in enhancements in the long run. This theory corresponds with the notion that exchange rate strategies should consider both prolonged consequences as highlighted by Pesaran, Shin and Smith (2001) and other research works as well.

In general, although the studies examined employ approaches and concentrate on facets of the exchange rate export correlation, they collectively underscore the significance of exchange rate control. Investigations consistently emphasize the necessity for exchange rates to bolster export performance and economic equilibrium. The ARDL model serves as an instrument for scrutinizing these dynamics while the J Curve phenomenon offers a framework for comprehending the repercussions of currency devaluations. Incorporating insights from these studies can assist in formulating policy measures to enhance export performance in Mauritania and to ensure stability. The study emphasizes the necessity of exchange rates to support export expansion for maintaining economic stability in Mauritania.

Overall, existing literature consistently underscores the influence of exchange rate changes on export performance. Research utilizing methodologies like the ARDL model offers insights into the connections between exchange rates, exports, and other variables. For Mauritania employing the ARDL approach can provide an understanding of how currency fluctuations affect export performance, thus, aiding in crafting policies to boost exports and sustain economic stability.

3. Methodology and Data

The study uses the Econometric Method of Ordinary Least Square for analyzing and estimating the impact of exchange rate on exportations in Mauritania within the period 1981 to 2017 to look for the relationship among the variables. The variables under consideration are the export of goods and a service which is considered as the dependent variable. The exchange rate, gross domestic product, real exchange rate and taxes less subsidies are the independents variables used in the methodology. The first step is applying the Augmented Dickey-Fuller test to check for the stationarity of the variables under loop. After that, the Auto Regressive Distributed Lag Model is using for analyzing the long-run and Error Correction Model for short run relationship between the variables under consideration. The sources of data collection are the websites of the Central Bank of Mauritania (BCM), the World Bank Data (WBD) and National Agency of statistics of Mauritania.

3.1.1 Regression analysis

A basic regression model can be specified as:
$EXPt = f(EXt, GDPt, RERt, TAXESt)$
This can be written as:
$EXPt = \beta0 + \beta1EXt + \beta2GDPt + \beta3RERt + \beta4TAXESt + \epsilon t$
A log-linear specification can be written as follows:
$log(EXPt) = \beta0 + \beta1log(EXt) + \beta2log(GDPt) + \beta3log(RERt) + \beta4log(TAXESt) + \epsilon t$
And then first difference transformation:
$\Delta log(EXPt)=\beta0+\beta1\Delta log(EXt)+\beta2\Delta log(GDPt)+\beta3\Delta log(RERt)+\beta4\Delta log(TAXESt)+\epsilon t$
Where:
D denotes the first difference
Dlog(EXPt) : the first difference of Logarithm of the exportations of goods and services at time t
Dlog(EXt) : the first difference of Logarithm of the exchange rate at time t
Dlog(GDPt) : the first difference of Logarithm of the gross domestic product at time t
Dlog(RERt) : the first difference of Logarithm of the real exchange rate at time t
Dlog(TAXESt) : the first difference of Logarithm of indirect taxes less subsidies at time t
ϵt is the error term.

3.1.2 Unit root test

It is investigated using the Augmented Dickey-Fuller (ADF) test for testing stationarity and determining the order of integration whether the variables are I(0) or I(1). Based on Dickey and Fuller (1979) individual equation specifications for the variables:

Export of Goods and Services (EXP)
$Dlog(EXPt) = \alpha + \beta t + \gamma log(EXPt - 1) + \sum_{I=1}^{P} \delta iDlog(EXPt - i) + \epsilon t$
Exchange Rate (EX)
$Dlog(EXt) = \alpha + \beta t + \gamma log(EXt - 1) + \sum_{I=1}^{P} \delta iDlog(EXt - i) + \epsilon t$
Gross Domestic Product (GDP)
$Dlog(GDPt) = \alpha + \beta t + \gamma log(GDPt - 1) + \sum_{I=1}^{P} \delta iDlog(GDPt - i) + \epsilon t$
Real Exchange Rate (RER)
$Dlog(RERt) = \alpha + \beta t + \gamma log(RERt - 1) + \sum_{I=1}^{P} \delta iDlog(RERt - i) + \epsilon t$
Taxes less Subsidies (Taxes)
$Dlog(Taxest) = \alpha + \beta t + \gamma log(Taxest - 1) + \sum_{I=1}^{P} \delta iDlog(Taxest - i) + \epsilon t$

Where:
t is the time trend
D denotes the first difference operator
α is a constant

β is the coefficient of the time trend

γ is the coefficient on the lagged value of the variable

δi are the coefficients on the lagged differences of variables

ϵtis the error term

The null hypothesis (H0) is that the variable has a unit root and the alternative hypothesis (H1) is that it is stationary.

3.1.3 Auto Regressive Distributive Lag (ARDL) and Error correction model (ECM)

After using the unit root tests of the variables, the Autoregressive distributive lag test is conducted to check long run relationship between export, exchange rate and other variables. Based on Pesaran, Shin and Smith (2001) a model specification of the (ARDL) and (ECM) after determining the order of integration of the variables is:

ARDL:

$$DLogEXPt = \alpha + \sum_{i=1}^{p} \times \beta iDLogEXPt - i + \sum_{i=0}^{q} \times \gamma iDLogGDPt - i + \sum_{i=0}^{r} \times \delta iDLogEXt - i + \sum_{i=0}^{S} \times \mu iDLogREERt - i + \sum_{i=0}^{U} \times \Omega iDLogTaxest - i + \lambda LogEXPt - 1 + \ell t$$

ECM:

$$DLogEXPt = \alpha + \sum_{i=1}^{p} \times \beta iDLogEXPt - i + \sum_{i=0}^{q} \times \gamma iDLogGDPt - i + \sum_{i=0}^{r} \times \delta iDLogEXt - i + \sum_{i=0}^{S} \times \mu iDLogREERt - i + \sum_{i=0}^{U} \times \Omega iDLogTaxest - i + +\phi ECMt - 1 + \epsilon t$$

Where:

D denotes the first difference operator.

Log (EXPt) is the logarithm of exports of goods and services at time t.

Log (EXt) is the logarithm of the exchange rate at time t.

Log (GDPt) is the logarithm of the gross domestic product at time ttt.

Log (RERt) is the logarithm of the real exchange rate at time ttt.

Log (TAXESt) is the logarithm of taxes less subsidies at time ttt.

α is the constant term.

βi, γi, δi, μi, Ωi are short-run coefficients.

λ is the coefficient of the lagged level term representing the long-run relationship.

ϕ is the coefficient of the error correction term, indicating the speed of adjustment to the long-run equilibrium.

ECMt−1is the error correction term derived from the long-run equilibrium relationship.

ϵt is the error term.

3.2 Results and Discussion

3.2.1 Regression Analysis

The analysis, in **Table (1)** offers insights into what influences exports in Mauritania between 1981 and 2017. The results reveal that a weaker Mauritanian currency as represented by the exchange rate (DLOG_EX) with a coefficient of 1.646746 linked to increased exports, supported by a p value of 0.0050. This implies that a depreciated currency may enhance the competitiveness of exports globally. Additionally, Gross Domestic Product (DLOG_GDP) demonstrates a correlation with exports, evident from its coefficient of 2.115007 and statistically significant p value of 0.0000; indicating that economic growth significantly impacts export performance by expanding production capacity and boosting export volumes. On the other hand, variables like the Real Exchange Rate (DLOG_RER) and Taxes (DLOG_TAXES) do not exhibit significance as predictors of exports in this particular model. This

suggests their direct influence on export performance is either limited or involves dynamics beyond what this model captures. The model shows a fit with an R value of 0.609878 and an adjusted R squared value of 0.552082, indicating that around 61% of the changes in exports are explained by the model. Moreover, the absence of heteroskedasticity as indicated by the Breusch Pagan Godfrey test in **Table (2),** and the appropriate Durbin Watson statistic (2.037415) which points to no autocorrelation, validate the reliability of the model's predictions.

To sum up, the analysis emphasizes how exchange rates and economic growth play roles in shaping Mauritania's export performance. It is important for policymakers to take these factors into account when devising strategies to boost the country's trade competitiveness. Additional research could enhance the model by investigating variables like trade policies and foreign direct investment well by utilizing different econometric methods to better understand long term effects and causal relationships. The CUSUM line in **Figure (3)** is staying within the 5% significance limits, showing that the process is stable and there are no shifts in the average. And, the CUSUM of Squares line in **Figure (4)** also remains within the 5% significance limits, suggesting variability in the process.

Table 1 : Regression Results

Variables	Coefficient	Std. Error	t-Statistic	Prob.
DLOG_EX	1.646746	0.538465	3.058222	0.0050
DLOG_GDP	2.115007	0.407797	5.184133	0.0000
DLOG_RER	0.028838	0.034193	0.843399	0.4064
DLOG_TAXES	0.475629	0.254439	1.869327	0.0727
C	-0.152502	0.054154	-2.816102	0.0090

| Model Statistic	Value
R-squared	0.609878
Adjusted R-squared	0.552082
Standard Error of Regression	0.150077
Sum of Squared Residuals	0.608125
Log-Likelihood	18.00374
F-Statistic	10.55228
Probability (F-Statistic)	0.000028
Mean of Dependent Variable	0.048168
Standard Deviation of Dependent Variable	0.224241
Akaike Information Criterion (AIC)	-0.812734
Schwarz Criterion (SC)	-0.583712
Hannan-Quinn Criterion (HQC)	-0.736820
Durbin-Watson Statistic	2.037415

Source: E-views 12

Table 2: Heteroskedasticity Test by Breusch-Pagan-Godfrey

Statistic	Value	Probability
F-statistic	0.792948	Prob.F(4,27)=0.5401
Obs R-squared	3.363980	Prob.Chi-square(4)0.4989
Scaled explained SS	3.250649	Prob.Chi-square(4)=0.5168

Source: E-views 12

Figure 3: CUSUM
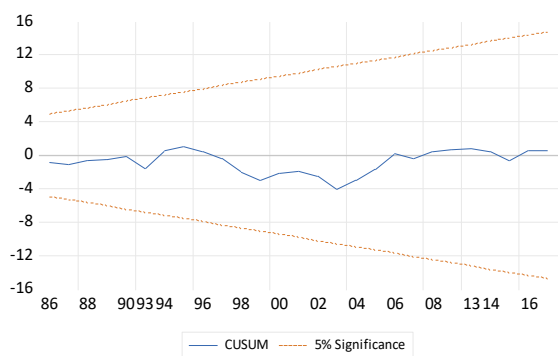
Source: E-views 12

Figure 4: CUSUM of Squares
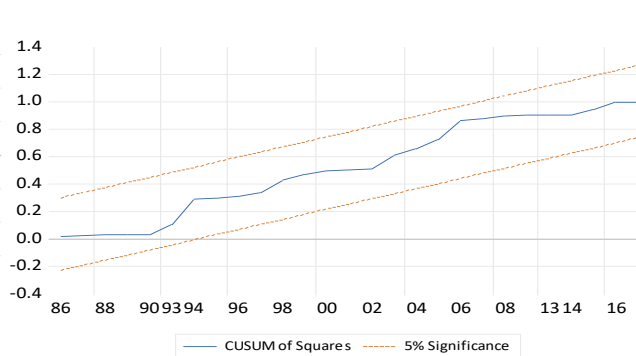
Source: E-views 12

3.2.2   The unit root test

The unit root test analysis was conducted to assess the stationarity of the variables by using the augmented Dickey-Fuller test (ADF) test. This revealed that all the variables are stationary at first difference and are integrated of order one I (1) except (RER) is stationary at level or I (0) with trend and intercept indicating a p-value of 0.0031 which is less than significance level 0.05. The null hypothesis is that the variables in the study have unit root, and the alternative is the opposite as results shown in **Table (3)**.

Table 3: Unit root test results by augmented Dickey-Fuller test (ADF)

Augmented Dickey-Fuller test							Order of integration
The variables	AT LEVEL			At First difference			
	intercept	Trend and intercept	none	intercept	Trend and intercept	none	
$\mathbf{log}$(EXP)	0.8556	0.2296	0.9979	0.0000			I(1)
log(EX)	0.9376	0.8113	0.9883	0.0001			I(1)
log(GDP)	0.8103	0.1643	1.0000	0.0000			I(1)
log(RER)	0.7564	0.0031	0.5521				I(0)
log(TAXES)	0.7434	0.4376	0.9958	0.0000			I(1)

Source: E-views 12

3.2.3   Bound test:

Due to the combination of the order of integration the ARDL model can be apply, and since the F-statistic value (8.08257) exceeds the upper value (3.49) at a significance level of 5%, we can reject the null hypothesis suggesting no relationship between the variables, as result shown in **Table (4)**. This suggests a long-run relationship exists between the dependent variable exportations of goods and services and the independent variables in the model. The bounds test confirms the presence of an equilibrium relationship among the variables at a 5% significance level. This, coupled with the error correction term, implies that the variables are integrated and that the model effectively captures long run dynamics.

Table (4) : Bound test

Test statistic	Value	Significance level	Lower bound	Upper bound
F-statistic	8.08257	5 %	2.56	3.49

Source : E-views 12

3.2.4   Error Correction Model

Table (5) shows the error correction term coefficient (ECM (- 1)) which stands at 0.8087. This reflects how quickly the system adjusts to its long run equilibrium after a deviation occurs. With a coefficient of 0.8087, around 80.87% of any deviation from the equilibrium is rectified within one period, thus,

showing a return to balance in the model. The p value of 0.0000 confirms this significance at 5% significance level. This robust statistic affirms the presence of the short run analysis using ECM model, as the value of the Error Correction model should be negative and less than 1 for the analysis of the short-run relationship. So, the evidence shows that there is a short-run relationship between variables.

Table (5): ECM

Variable	Coefficient	Prob
ECM (-1)	-0.8087	0.0000

Source : E-views 12

3.2.5   Recommendation

Implement Exchange Rate Stabilization Measures: Mauritania needs to focus on implementing strategies to stabilize its currency exchange rate by employing fiscal policies. By minimizing fluctuations in currency values and creating an enabling economic climate, the nation can boost investor trust and promote continuous economic development. According to Edwards (1987), maintaining exchange rates is crucial for decreasing economic unpredictability and fostering a solid economic foundation.

Enhance Structural Reforms to Improve Economic Flexibility: Mauritania should focus on implementing reforms to enhance its flexibility and resilience against exchange rate fluctuations. This involves improving trade policies, increasing efficiency in the market, and investing in infrastructure. Bahmani Oskooee (1986) stresses the importance of reforms in improving adaptability and competitiveness which, in turn, supports stable trade flows and economic stability.

Adjust Trade Policies to Mitigate Negative Effects of Exchange Rate Volatility: To counteract the impacts of exchange rate volatility on trade, Mauritania could consider adjusting its trade policies. This may include reviewing tariffs and subsidies to better manage the effects of currency fluctuations on exports and imports. According to Hooper and Kohlhagen (1978), planned trade policies can help alleviate the effects of exchange rate uncertainty, on international trade.

4.   Conclusion

This study has explored how fluctuations in exchange rates impact the export performance of Mauritania by using data from 1981 to 2017 obtained from the Central Bank of Mauritania and the World Bank. By conducting analysis, including tests like the Augmented Dickey Fuller (ADF) test and models such as

Auto Regressive Distributed Lag (ARDL) and Error Correction Models (ECM), the study found that exchange rate fluctuations positively influence Mauritania's exports. This discovery suggests that changes in exchange rates can boost the competitiveness of products in markets, thus, potentially leading to increased export levels and contributing to economic growth. Furthermore, the study indicates a correlation between product (GDP) and exchange rates highlighting a crucial connection between economic expansion and currency values.

The importance of these findings emphasizes the need for Mauritania to address issues related to exchange rate volatility. High variations in exchange rates can create uncertainty for businesses and investors, impacting trade performance and overall economic stability negatively. To counter these challenges and to promote progress, several significant policy recommendations arise from this study.

To start with, Mauritania should concentrate on enacting reforms aimed at enhancing adaptability. To enhance Mauritania's competitiveness, it is essential to refine trade policies, improve financial market operations and invest in infrastructure. These reforms will help the economy withstand currency fluctuations, thus ensuring trade flows and sustained economic development. As previous studies on developing nations have pointed out, structural changes play a role in enabling the economy to absorb external shocks. Moreover, Mauritania must adjust its trade strategies to mitigate the impacts of exchange rate volatility. Modifying tariffs and subsidies can help offset effects on the export sector caused by currency fluctuations. Implementing these changes can stabilize the trade imbalance. Also, there is a need to foster a balanced economic landscape. Effective trade policies are crucial for preserving trade equilibrium and fostering stability, all of which are essential components of an economic framework.

Lastly prioritizing actions to stabilize the exchange rate is key for Mauritania's wellbeing. This can be achieved through well-crafted fiscal policies aimed at reducing exchange rate fluctuations. A stable exchange rate will create an environment for trade and investment, thus boosting growth and stability. Research underscores that maintaining exchange rate stability is pivotal in reducing uncertainties and nurturing an environment for growth. Ultimately, Mauritania needs to handle currency fluctuations efficiently to enhance its trade balance and to ensure stability. By following the proposed methods such as improving reforms, adapting trade policies, and stabilizing the exchange rate, Mauritania can effectively deal with the challenges posed by currency fluctuations. This approach will help boost exports, foster economic growth, and establish a balanced economy. These actions are essential for maintaining progress and for attaining lasting economic stability.

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