# Capability of creating an optional unified currency between Egypt and Sudan

## By

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# Capability of creating an optional unified currency between Egypt and Sudan

*Dr. Ayman Salah Eldeen and Dr. Osama Mohamed Mobarez*

## ABSTRACT

This research deals with the concept of optional currency in general, and Arab economic cooperation within optional unified currency, it considers the problem of Egyptian Sudanese- currencies without this optional currency, and how this optional currency can solve their problem.

The Egyptian-Sudanese cooperation has walked a long way since the mid-seventies of the last century, in phases that are sometimes connected, sometimes intermittent and frozen in other times. However, the talk about integration has not stopped, since independence has remained the preferred integration towards unity between the two countries as a desired goal for a large number of Egyptians and Sudanese, as we have seen that the slogan of the unity of the Nile Valley appears from time to time and appears to reality in one way or another.

So, the researchers apply a gravity model to study the capability of creating an optional unified currency between Egypt and Sudan, after applying gravity model between Egypt and Sudan researchers argued that there is a great capability for creating the currency, and argued that the two nations can benefit from coordination with a common optional unified currency.

**Keywords**: Optional currency, Egyptian Economy, Sudan economy, Economic growth, influence of integration on GDP.

## INTRODUCTION

The possibility of creating an optional currency between Egypt and Sudan, so this currency applies to intra-trade between Egypt and Sudan without using other currencies in transactions. If this process extends between the Arab countries as a unified optional currency is applied within the commercial transactions that take place between the Arab countries, and the capability in any central bank to make exchange for the optional currency for any currency, then the currencies will preserved by their central banks, and the value of these optional currency comes from the basket of currencies that were exchanged and preserved in central banks.

The Egyptian currency after the November 2016 flotation reached an unprecedented reduction, and this happened in the Sudanese currency after the flotation that took place in 2021. the economic gravity between the two countries confirms the ability of the two countries to use a unified optional currency.

The issue of political and economic cooperation and integration is an important issue that is being widely raised at the theoretical and practical levels, as well as at the official and informal levels. The Arab world faces huge challenges and severe external dangers, and the Arab world does not benefit from the diversity of capabilities that are available within the Arab country, and the need appears. The strong tendency to rally after the manifestations of weakness and dispersion that occurred after the Arab Spring, and perhaps the manifestations of weakness and dispersion, led to the weakening of affiliations to small countries, each country separately; thus, belonging to a large and strong Arab state would be able to face economic challenges with fruitful and constructive cooperation.

The changes that the international community has witnessed during the past few years have increased the negative interference affecting the Arab world through the effects of the Russian War on Ukraine, and its impact on Egypt's wheat imports, in addition

to the severe water impact due to the filling of the Ethiopian reservoir, which made the situation worse, so it is necessary for powerful economic blocs to get out of these crises in time before it is too late.

Through this, the importance of cooperation and economic and political integration at the national level emerges with the aim of demolishing the manifestations of disagreement and disparity, and expanding and consolidating the manifestations of cooperation, in order to achieve the goals of integration by activating the high capabilities inherent in Arab countries and using their super wealth as the heart of the world.

The Egyptian-Sudanese cooperation has walked a long way since the mid-seventies of the last century, in phases that are sometimes connected, sometimes intermittent and frozen in other times. Nevertheless, discussions on integration have not stopped. A large number of Egyptians and Sudanese and we have seen the slogan of the unity of the Nile Valley appear from time to time and appear to reality in one way or another.

The two governments aim to frame an integrative and sustainable strategic partnership that will benefit from the accumulated integration experiences and awareness of the economic, technological, and international regional changes in preparation for real unity based on the development of human and natural capabilities to enhance interdependence, achieve mutual benefits, and maintain national security throughout the Nile Valley. This is based on a reference document that takes its power on political and popular issues through its presentation and approval in the executive and legislative bodies of the two countries, provided that it is formally deposited with the League of Arab States and the Organization of African Unity.

The first reference to the Four Freedoms Agreement was received during President Omar al-Bashir's visit to Cairo on January 19, 2004. Egypt and Sudan signed the Four Freedoms Agreement, which provides freedom of ownership, movement, residence, and work. This was announced by Sudanese Foreign Minister Mustafa Osman Ismail after his meeting with his Egyptian counterpart Ahmed Abu Al-Ghait, Mustafa said that the documents were approved by the Council of Ministers in the two countries and were signed by Presidents Mubarak and Al-Bashir. He explained that these agreements stipulated that these documents enter into force 30 days after the date of their exchange.

The agreement, approved by the parliaments of the two countries, authorizes Egyptian and Sudanese citizens to reside in another country, to work and own real estate, and to carry out all legitimate activities in the other country.

## 2- Literature review.

We are looking into this topic because of the lack of studies on it, which has long been one of the most successful empirical models in economics. Incorporating the deeper theoretical foundations of gravity into recent practice has led to a richer and more accurate estimation and interpretation of the spatial relations described by gravity. A wider acceptance follows Anderson ( 2011).

The gravity model has been used extensively in the international trade literature over the past 50 years (Anderson, 2010). The gravity model was first applied by Tinbergen (Salvatici, 2013 (Pöyhönen, 1963), who proposed that bilateral trade flows between two countries are positively related to their respective national incomes and negatively related to their bilateral distance. The estimable form of this equation leads to the core gravity model, which has gained popularity because it yields robust estimates. However, until recently, the gravity model was "an intellectual orphan, unconnected to the rich family of economic theory" (Anderson, 2010). Most of the studies in incorporate new

theoretical foundations of the gravity model, leading to more accurate estimation and interpretation of spatial relations.

Bergstrand and Egger (Bergstrand, 2007) develop a theoretical model that simultaneously estimates the gravity equations of bilateral final goods trade, intermediate goods trade, and foreign direct investment (FDI) flows. Their predicted theoretical propositions are empirically validated, leading the authors to conclude that Ethier's ( 1982) intermediate-inputs approach is relevant in explaining the actual patterns of bilateral intermediate outsourcing flows. Anderson ( 2003) extends the multilateral resistance terms by considering when the seller's and buyer's incidence of trade costs is determined in an aggregate fashion, whereby all shipments are made from and to a basket of commodities.

Abderehim Mohammed and others focus on The Role of Economic Integration Between Egypt, Libya and Sudan on Intra-Trade of the Main Food Groups and Commodities, The goal of this study is to define the influence of economic integration between Egypt, Libya and Sudan on their intra and outside trade of main food commodities, The study used many of the quantitative analytical Methods to achieve its goal. The study achieved the following results: 1- Despite the low magnitude of intra-regional trade of the main food groups and commodities between Egypt, Libya and Sudan, but it shows that there is an increase in intraregional trade rate between these countries where Egypt's exports to Libya raises by about 10.80% of grain, 9.23%of oilseed, 20.64% of oils, 17.86% of legumes, 20.69 of tubers, 26.18% of vegetables, 17.37% of fruits, 22.73% of Dairy, and 23.42% of sugar, while the rate of the increase in Egypt's exports to Sudan raises to about 18.71% of oil, 17.58% of legumes, 23.36% of vegetables, 21.09% in fruits, 18.46% of dairy, and 22%of sugar, The rate of increase in Sudan's exports to Libya from oilseeds amounted to about 15.72 2- Achieving an economic integration between these countries can: a- Raises the intra- trade

of food commodities by about1906.5 million dollars which represent about1386% from current intra trade of these commodities. b) Decrease in total external trade of agricultural commodities in Egypt, Libya, and Sudan by approximately 21.2%. 3- In lights of the above results its seems that establishment of an economic integration between the three countries render the national security of these countries (Abderehim, 2016)

Yosra Idris and others focus on the possibilities of expanding the area, production and specialization of legume crops in some Arab countries, the Arab world extends from the Arabian Gulf to the east and the Atlantic Ocean to the west. The Arab World has many environmental regions with different climates. The expansion of legume cultivation in the Arab world is of great importance. The establishment of specialization in production is one of the most significant factors in the formation of a unified Arab bloc. It helps integrate countries through the need of one country to other countries, which excelled in the production of certain goods through creativity in production and decreasing production costs to the lowest level. Arab countries were divided regionally into the Arab Eastern Region, Middle Region, and Arab Western Region. Some legume crops as well as winter and summer cereals have also been studied. The problem with this study is the small area and production of legume crops at the level of the Arab world. The main reason for the decrease in the area cultivated with legume crops is the expansion of cereals compared to the legume crops. This study aims to determine the possibility of agricultural specialization in the field of legume production and determine its success in the Arab world by measuring the effect of specialization on increasing the area, production, and reducing the production costs of legume crops, which leads to the possibility of increasing integration between Arab countries to form a united Arab bloc to confront other economic blocs. This study focused on the possibility of production specialization of legume crops according to the principle of comparative advantage through specialization

in some legume crops by expanding their area within the cereal area using published data, such as FAO statistics, Arabic Organization for Agriculture Development (AOAD) statistics, and websites. The study reached several results, including: In the Arab Eastern Region, it is better for Jordan to include the area of barley to green beans, increasing its production from 12.80 to 737.36 thousand tons, achieving a huge production boom that lead to specialization in its production. Lebanon is characterized by the cultivation of lupins and can expand its area of wheat or barley to raise its production, giving him the advantage to specialize in it. Yemen can expand the area of chick peas from the area of wheat or barley to raise its production when they are added to chick peas, giving a distinction to Yemen to specialize in it. It is better for Yemen to include sorghum in the area of dry beans, which leads to specialization. The results of the Middle Region showed that Egypt would prefer to specialize in the production of green beans by expanding it to the area of barley according to the principle of comparative advantage. Egypt is estimated to be unable to specialize in summer legumes. If Sudan plans to expand chickpeas by adding wheat area to it, its production will increase, leading to specialization in its production. It is best to include the area of rice in the area of the dry beans. The results of the Arab Western Region showed that Tunisia and Morocco cannot specialize in the production of winter legume crops by expanding their area cultivated by adding cereals to them. For summer crops, it is better for Morocco to expand the soybean area by adding maize. The results of Algeria pointed to the possibility of expanding the cultivation of broad beans by adding barley, which drives Algeria to specialize in it. It is better for Algeria to benefit from the relative advantage of specialization to expand the area cultivated with dry beans instead of rice to save water. Several recommendations can be made, which may be the most important, regarding the possibility of agricultural specialization in the production of some leguminous crops with comparative advantages and expansion of

their area at the expense of narrowing the cultivated area of cereal crops by studying all the economic conditions surrounding their production and consumption. The importance of activating and increasing the effectiveness of Arab specialization in the field of increasing the production of legume crops, which is an appropriate input for Arab agricultural economic integration among Arab countries in the field of legume production. The division of Arab countries into regions to form the heart for the establishment of a united Arab economic bloc and push towards a joint Arab agricultural strategy aimed at improving the Arab economy and preserving the interests of Arab countries in global blocs (Idris, 2018).

Mohsen Bagnied and Mark Speece focus on marketing and regional integration for food security in the Arab world, and adapt Hunt's (2011, 2014) resource advantage (RA) theory as used in marketing and macro marketing (as well as several other fields) to a country- and sub-region-level analysis of competitiveness in agriculture and agribusiness. The two sub-regions, the Arab Gulf States and Nile Valley (Egypt and Sudan), are not competitive and, in fact, are both dependent on food imports. This heavy dependence is not sustainable in long run, and food security become a critical issue for these countries. RA theory shows that as a unit, the two sub-regions have complementary strengths; together, they could become quite competitive and could solve their food security problems (Bagnied,2019).

Imad Eldin Elfadil, and Sulieman Ismail focus on the Potentials for agricultural trade in COMESA region: a comparative study of Sudan, Egypt and Kenya, this paper aimed at quantifying potentials of intra-regional agricultural trade in COMESA region taking examples of Sudan, Egypt and Kenya. Different indicators and indices such as the instability index, production similarity index, comparative production performance index, export similarity index, and revealed comparative advantage index. The results showed a potential for intraregional agricultural trade. The

instability indices of production in cereals, pulses, roots, and tubers were more stable at the regional level than at the national level. The results of the production similarity index indicate differences in the production patterns of the countries analyzed. Export similarity indices results show that countries are dissimilar in their export patterns. The revealed comparative advantage indices, considering each country separately, are generally higher for the dominant export products. As dominant products differ among the countries the pattern of specialization differs considerably among those countries, and therefore, there is a potential for expanding intra-regional trade in this region. The paper concluded that the government policies of COMESA member countries, especially Sudan, should pay more emphasis to encourage integrating their markets regionally to benefits from trade and comparative advantage exist in the region (Imad, 2007).

Jeroen Verhagen and others, focus on Operational planning of WEF infrastructure and quantifying the value of information sharing and cooperation in the Eastern Nile basin, as Integrating the planning of a multi-reservoir system in nexus with agricultural and electricity infrastructure could alleviate security concerns for these resources in regions where demand is growing while water and land scarcity are exacerbated by climate change and anthropogenic pressures. This study focuses on the advantages of integration and cooperation in the Eastern Nile Basin. To overcome limitations of equilibrium and soft-linked partial equilibrium models (e.g. high levels of spatial aggregation, non-insightful cooperation scenarios and a lack of heterogeneity), it propose a regional hard-linked WEF-nexus model that explicitly represents resource connectivity networks for water and electricity, and describes heterogeneity in resource availability, production potentials and physical constraints. Using a non-linear operational process, it optimize reservoir operations, water allocations, cropping patterns, electricity mixes and trade quantities on a monthly time-step over multiple years in a receding

horizon fashion to increase economic benefits for each country and regionally. This iterative implementation allows the modelling of operational changes as feedback against exogenous climate disturbances and enables exchanging information between upstream-downstream countries. It describes four different levels of cooperation with the corresponding constraints and policies.

Compared to the reference scenario of unilateral planning, its results indicate an increase in regional economic returns for scenarios in which river flow information is shared between countries (+9%), river flow and trade information are shared (+10%) and WEF resources are coordinated regionally (+15%). These increased returns successively come from an increase in the effectiveness of agricultural water consumption, especially in Sudan, a change in trade patterns for agricultural products and a shift in cropping patterns. These findings underscore the importance of representations of spatial and temporal heterogeneity of resources and their connectivity, as well as the need for a more diverse set of collaboration to facilitate planning in river systems (Verhagen, 2021).

## 3- Data and methodology

### Model data:

Gravity models in their traditional form are inspired by Newton law of gravitation:

$$F_{ij} = G \cdot \frac{M_i M_j}{D^2_{ij}} \text{ (which is } \left(\frac{GDP_i GDP_j}{D^2_{ij}}\right) \text{ in our model)}$$

The force $F$ between two bodies $i$ and $j$ with $i \neq j$ is proportional to the masses $M$ of these bodies and inversely proportional to the square of their geographical distance $D$. $G$ is a constant, so in our model we substitute the force with the gross trade between the two countries, and the masses by the GDP, the distance still the distance between the Egypt and kartoum countries.

So this model is inspired from the traditional gravity model of James E. Anderson, and modified to Fit the case of the state of Sudan.

The study has four variables according to gravity model, the dependent variable is the natural logarithm of xij, which is the sum of the Sudan export to Egypt and Sudan import from Egypt, that was because of the lack of historical data on Egyptian exports to Sudan, so we substitute Egyptian exports to Sudan by Sudan imports from Egypt ("IMF", 2023), the independent variable is the natural logarithm of $(\frac{GDP_i GDP_j}{D^2_{ij}})$, where $GDP_i$ is the Egyptian gross domestic product (current US\$) and $GDP_j$ is the Sudanese gross domestic product (in current US\$) using annual data from 1965 until 2020 of world bank for Egypt (World Bank , 2023) and Sudan (World Bank , 2023), $D^2_{ij}$ is the square of the distance between Egypt and Kartoum which is 1271 km ("Distance Egypt an Kartoum", 2023.

The dependent variable is the natural logarithm of xij stands for LNXIJ to enter data in e-views program.

The independent variable is the natural logarithm of $(\frac{GDP_i GDP_j}{D^2_{ij}})$, stands for LNMM to enter data in e-views program.

### 4- Discussion and results

The researchers apply the gravity model by using the ARDL model to indicate the short- and long-run relationships, and the initiation of the autoregressive distributed lag (ARDL) method or Bounds test is due to Pesaran and Shin (1999) (Pesaran, 1999), while its further development is due to Pesaran et al. (2001) (Pesaran 2001). This is acknowledged as one of the most flexible econometric analysis methodss.

The ability to host sufficient lags enables the best capture of the data-generating process mechanism. This translates into the

fact that the method can be applied irrespective of whether the time series is I(0), namely stationary at levels I(1), stationary at first differences, or fractionally integrated. Nevertheless, within the ARDL framework, the series must not be I(2) because this integration order invalidates the F-statistics and all the critical values established by Pesaran.

Furthermore, the ARDL method provides unbiased estimates and valid t-statistics irrespective of the endogeneity of some regressors (Harris, 2003) (Jalil, 2008). In fact, because of the appropriate lag selection, the residual correlation is eliminated, and thus the endogeneity problem is mitigated (Ali, 2016). Short-run adjustments can be integrated with long-run equilibrium through the error correction mechanism (ECM). This occurs through a linear transformation, without sacrificing information about the long-run horizon. Another aspect is that the method allows the correction of outliers with impulse dummies, and the approach distinguishes between the dependent and independent variables.

Last but not the least, the interpretation of the ARDL approach and its implementation is quite straightforward (Rahman, 2017) and the ARDL framework requires a single form equation (Bayer, 2013), while other procedures require a system of equations. The ARDL approach is more reliable for small samples than Johansen and Juselius' cointegration methodology. Halicioglu (2007) also mentions two more advantages of the method, which are the simultaneous estimation of short- and long-run effects and the ability to test hypotheses on the estimated coefficients in the long run. This is not done in the Engle–Granger method.

## 4.1- Unit root test

The first step in the ARDL analysis, is the unit root analysis. It informs about the degree of integration of each variable. To satisfy the bounds test assumption of the ARDL models, each variable must be I(0) or I(1). Under no circumstances, should it be I(2).

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Unit root analysis is performed with a long array of tests such as for example the augmented Dickey Fuller (ADF) and the Kwiatkowski–Phillips–Schmidt–Shin (KPSS), the Phillips–Perron (PP), the Ng–Perron test, the cross-sectional augmented IPS-CIPS (Pesaran 2007), the LS (Lee and Strazicich 2003) (Lee, 2003), and many others. Each one is more compatible with different data characteristics, but this paper will not discuss them for brevity reasons. However, it should be stressed that researchers should apply both augmented Dickey Fuller (ADF) and Phillips–Perron (PP) unit root tests to make sure that the variables are not I(2).

## Unit root test

| UNIT ROOT TEST TABLE (PP) | | | |
|---|---|---|---|
| **At Level** | | | |
| | | LNXIJ | LNMM |
| With Constant | t-Statistic | -1.0076 | -1.9176 |
| | *Prob.* | *0.7446* | *0.3220* |
| | | n0 | n0 |
| With Constant & Trend | t-Statistic | -4.1919 | -1.3132 |
| | *Prob.* | *0.0085* | *0.8743* |
| | | *** | n0 |
| Without Constant & Trend | t-Statistic | 2.4475 | 3.1260 |
| | *Prob.* | *0.9961* | *0.9994* |
| | | n0 | n0 |
| **At First Difference** | | | |
| | | d(LNXIJ) | d(LNMM) |
| With Constant | t-Statistic | -12.2885 | -5.5394 |
| | *Prob.* | *0.0000* | *0.0000* |
| | | *** | *** |
| With Constant & Trend | t-Statistic | -12.1806 | -5.8127 |
| | *Prob.* | *0.0000* | *0.0001* |
| | | *** | *** |
| Without Constant & Trend | t-Statistic | -10.8019 | -4.5750 |
| | *Prob.* | *0.0000* | *0.0000* |
| | | *** | *** |
| UNIT ROOT TEST TABLE (ADF) | | | |
| **At Level** | | | |
| | | LNXIJ | LNMM |
| With Constant | t-Statistic | -0.1960 | -2.0356 |

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| | | | |
|---|---|---|---|
| | *Prob.* | *0.9322* | *0.2712* |
| | | n0 | n0 |
| With Constant & Trend | t-Statistic | -4.0540 | -1.6320 |
| | *Prob.* | *0.0124* | *0.7670* |
| | | ** | n0 |
| Without Constant & Trend | t-Statistic | 2.8546 | 3.8615 |
| | *Prob.* | *0.9987* | *0.9999* |
| | | n0 | n0 |
| **At First Difference** | | | |
| | | d(LNXIJ) | d(LNMM) |
| With Constant | t-Statistic | -8.6122 | -5.5394 |
| | *Prob.* | *0.0000* | *0.0000* |
| | | *** | *** |
| With Constant & Trend | t-Statistic | -8.5407 | -5.8203 |
| | *Prob.* | *0.0000* | *0.0001* |
| | | *** | *** |
| Without Constant & Trend | t-Statistic | -10.2405 | -4.6141 |
| | *Prob.* | *0.0000* | *0.0000* |
| Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant | | | |

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It is clear from the previous table that all-time series are stable at the first difference, which is compatible with the conditions of the ARDL model, Auto regressive distributive lag model equation

## 4.2-  Auto regressive distributive lag model equation

| Variable | Coefficient | Std. Error | t-Statistic | Prob.* |
|---|---|---|---|---|
| | | | | |
| LNXIJ(-1) | 0.393099 | 0.140195 | 2.803940 | 0.0072 |
| LNXIJ(-2) | 0.072925 | 0.153592 | 0.474798 | 0.6370 |
| LNXIJ(-3) | 0.309222 | 0.138108 | 2.238984 | 0.0297 |
| LNMM | 0.128742 | 0.080899 | 1.591406 | 0.1179 |
| | | | | |
| R-squared | 0.919632 | Mean dependent var | | 18.80793 |
| Adjusted R-squared | 0.914711 | S.D. dependent var | | 1.290688 |
| S.E. of regression | 0.376936 | Akaike info criterion | | 0.958987 |
| Sum squared resid | 6.961944 | Schwarz criterion | | 1.107689 |
| Log likelihood | -21.41316 | Hannan-Quinn criter. | | 1.016171 |
| Durbin-Watson stat | 1.979674 | | | |
| | | | | |

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It is clear from the previous table that the relationship between the independent variable and the dependent variable is very strong and that changes that occur in the independent variables explain 91.9 % of the changes that occur in the dependent variable.

### 4.3- ARDL long run form and bound test.

The ARDL analysis occurs as follows: If the existence of cointegration is confirmed in Equations (1) and (2), then the long-run and the short-run models are estimated and both long and short-run elasticities are derived, namely the ARDL equivalent of the UECM (Unrestricted error correction model). Cointegration, in the ARDL bounds test approach, is examined under the following hypothesis set up:

$$H_0 : a_1 = a_2 = a_n = 0$$

$$H_1 : a_1 \neq a_2 \neq a_n \neq 0$$

The setup of the hypotheses reads as follows: there is cointegration if the null hypothesis is rejected. The F-statistics for testing are compared with the critical values developed by Pesaran et al. (2001). Narayan critical values are more appropriate for small samples. Pesaran et al. (2001) provide a table enumerated as CI and entitled: "Asymptotic critical value bounds for the F-statistic. Testing for the existence of a levels relationship" in five versions. These are (i) no intercept and no trend, (ii) restricted intercept and no trend, (iii) unrestricted intercept and no trend, (iv) unrestricted intercept and restricted trend, and (v) unrestricted intercept and unrestricted trend. They also provide a table CII entitled "Asymptotic critical value bounds for the t-statistic. Testing for the existence of a levels relationship" in three versions: (i) No intercept and no trend, (ii) unrestricted intercept and no trend, (iii) unrestricted intercept and unrestricted trend. Next, we reproduce a part of these tables (CI-iii and CI-v) to explain how the decision for cointegration was made in Bölük and Mert (2015) based on Pesaran tables. Note that Pesaran

tables are not valid for I(2) variables (Ali et al. 2016). The interested reader can find these tables in Pesaran et al. (2001).

| Conditional Error Correction Regression | | | | |
|---|---|---|---|---|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| LNXIJ(-1)* | -0.224753 | 0.146601 | -1.533099 | 0.1317 |
| LNMM** | 0.128742 | 0.080899 | 1.591406 | 0.1179 |
| D(LNXIJ(-1)) | -0.382147 | 0.160186 | -2.385641 | 0.0210 |
| D(LNXIJ(-2)) | -0.309222 | 0.138108 | -2.238984 | 0.0297 |
| Levels Equation | | | | |
| Case 1: No Constant and No Trend | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| LNMM | 0.572817 | 0.015532 | 36.87906 | 0.0000 |
| F-Bounds Test | | Null Hypothesis: No levels relationship | | |
| Test Statistic | Value | Signif. | I(0) | I(1) |
| | | | Asymptotic: n=1000 | |
| F-statistic | 5.465497 | 10% | 2.44 | 3.28 |
| k | 1 | 5% | 3.15 | 4.11 |
| | | 2.5% | 3.88 | 4.92 |
| | | 1% | 4.81 | 6.02 |

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Here the long-run equation indicates a positive relationship between the LNMM and the $X_{ij}$ , and a negative relationship with the labor force, the calculated F is above the upper bound of the tabulated f at 1% significance.

## 4-4- Error correction model (short term equation)

| ECM Regression | | | | |
|---|---|---|---|---|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| | | | | |
| D(LNXIJ(-1)) | -0.382147 | 0.123974 | -3.082483 | 0.0034 |
| D(LNXIJ(-2)) | -0.309222 | 0.125870 | -2.456684 | 0.0176 |
| CointEq(-1)* | -0.224753 | 0.067296 | -3.339772 | 0.0016 |
| | | | | |
| R-squared | 0.297008 | Mean dependent var | | 0.085270 |
| Adjusted R-squared | 0.268888 | S.D. dependent var | | 0.436404 |
| S.E. of regression | 0.373147 | Akaike info criterion | | 0.921252 |
| Sum squared resid | 6.961944 | Schwarz criterion | | 1.032777 |
| Log likelihood | -21.41316 | Hannan-Quinn criter. | | 0.964139 |
| Durbin-Watson stat | 1.979674 | | | |

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In the error correction model the cointegration coefficient has a negative sign at a significance of 1%, which is compatible with ARDL method, the correlation coefficient is 0.2 which gives a weak relationship in the short run, The benefits of merger are difficult to reap in the short term due to the difference in internal policies and regulations of the two countries, but in the long term the effects of the optional unified currency become clear after the expansion of intra-regional trade without the use of foreign currencies, and after the replacement of foreign imports that requires the establishment of many factories within the two countries.

### Breusch-Godfrey Serial Correlation LM Test:

| Breusch-Godfrey Serial Correlation LM Test: | | | |
|---|---|---|---|
| | | | |
| F-statistic | 0.043900 | Prob. F(2,47) | 0.9571 |
| Obs*R-squared | 0.098823 | Prob. Chi-Square(2) | 0.9518 |

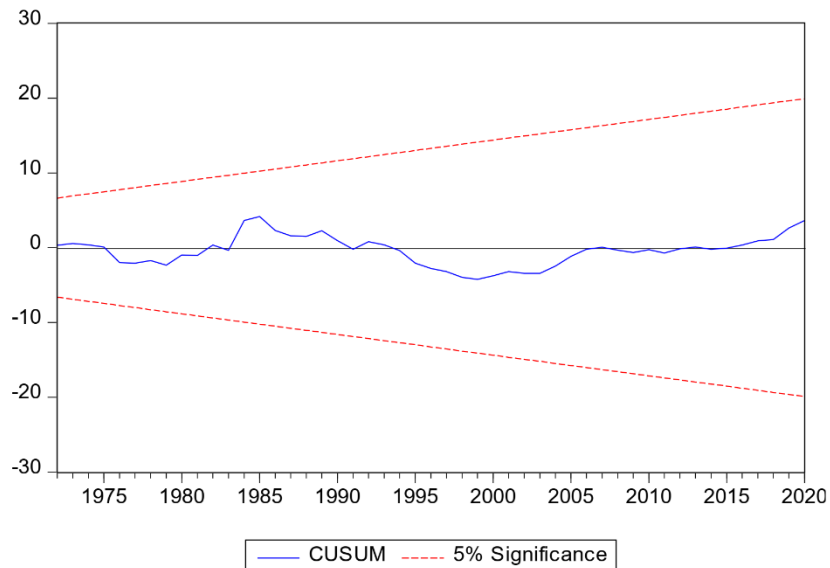Calculated by researchers using statistical data packages E-VIEWS

In the Heteroskedasticity Test: Breusch-Godfrey Serial Correlation LM Test the significance of F- statistics stands at 0.9571 so we can deny the null hypothesis, so there is no homoscedasticity problem.

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4-5-  Cusum test



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Plots of stability tests using Cusum test implying the stability of both long run and short rum coefficients at 5% significance.

The second model for

## 5- Conclusion

Empirical study gives an evidence for a positive long run relationship between the dependent and independent variable, the researchers argued that increasing the sum of GDP for Egypt and Sudan by 1$ will increase the gravity Between the two nations by a half dollar, which mean that the integration between the two countries is very compatible.

By the optional currency more and more benefits can gained, there is no longer a need to deal in the dollar in intra-trade between Egypt and Sudan, and if other Arab countries enter into using the optional single currency, the scope of cooperation will expand, and the dollar will not enter into intra-trade between Arab countries. This will stimulate the Arab countries to industrialize and deal in Among them, this will make the international market look like a local market, which will reduce the demand for the dollar and increase the

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demand for the new optional currency, which will enhance its value and enhance the advantages of cooperation between the Arab countries that use this unified optional currency.

We argued that there is a comparative advantage in Sudan production for crops and agriculture production, and Egypt has its advantage in its large population which can improve the Sudan agriculture program and Compensating the water loss due to the Ethiopian dam, the population increase will devour the remaining amount of agricultural production after the water shortage, and the way is to expand mutual benefits due to the relative advantages between Egypt and Sudan, and increase the capacity of the two peoples. Sudan suffered from separation and the loss of Sudanese resources after the secession of the wealthy south, Egypt has suffered after the Ethiopian dams, and the way out of this predicament is to unite the ranks, which is the way to unite the ranks until the two countries move away from borrowing from abroad and rely on themselves to manage their sources of income and compensate for the loss of natural resources that occurred due to foreign pressures on the two countries.

## Policy implementation

The researchers describe the necessity of accelerating the pace of economic cooperation between Egypt and Sudan by Creating an optional unified currency, in order to get out of the current problems that occurred due to the division of Arab countries after the Arab spring, and the deterioration of the state of industrialization in the Arab countries, the Arab countries must have their economic character, and this will only happen with effective integration.

Egypt and Sudan must cooperate more to reach real steps of economic cooperation, to face the great competition that occurred at the global level, and to face the scourge caused by the war The Russian-Ukrainian and the decline in imports of wheat, through the expansion of wheat production in Sudan through joint cooperation, not as two countries, but as one country seeking to break into global markets.

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# إمكانية إنشاء عملة موحدة اختيارية بين مصر والسودان

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**الملخص**

يتناول هذا البحث مفهوم العملة الاختيارية بشكل عام، والتعاون الاقتصادي العربي من خلال العملة الاختيارية الموحدة، ويتناول مشكلة العملات المصرية السودانية بدون هذه العملة الاختيارية، وكيف يمكن لهذه العملة الاختيارية أن تحل مشكلتهم.

قطع التعاون المصري السوداني شوطا طويلا منذ منتصف السبعينيات من القرن الماضي، في مراحل متصلة تارة ومتقطعة تارة ومتجمدة تارة أخرى. إلا أن الحديث عن التكامل لم يتوقف، إذ ظل الاستقلال هو التكامل المفضل نحو الوحدة بين البلدين كهدف مرغوب فيه لعدد كبير من المصريين والسودانيين، كما رأينا أن شعار وحدة وادي النيل تظهر بين الحين والآخر وتظهر للواقع بشكل أو بآخر.

لذا قام الباحثون بتطبيق نموذج الجاذبية لدراسة إمكانية إنشاء عملة موحدة اختيارية بين مصر والسودان، وبعد تطبيق نموذج الجاذبية بين مصر والسودان أكد الباحثون أن هناك قدرة كبيرة على إنشاء العملة، ورأوا أن الدولتين يمكنهم الاستفادة من التنسيق مع عملة موحدة اختيارية مشتركة.