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Abstract:

This paper attempts to measure the impact of the COVID-19 pandemic on trade openness in the Arab Republic of Egypt with the introduction of both the final government spending, the final household spending, and the general consumer price index as independent variables controlled using annual and monthly time series data during the period 2015-2021 as an extended period showing the comparative impact between before and during the pandemic using the distributed time-gap self-reference method (ARDL) developed by Pesaran et al (2001) to test the long-term relationship between the variables and the dynamic relationship in the short term through the application of multiple regression model (Multiple Regression Model).

The results showed that there is an inverse relationship in the long and short term between the number of Covid-19 infections, public government spending, final household spending on one side, and trade openness on the other. Also, there is a strong proportional relationship between the record for prices consumed and trade openness in the short and long term.

Keywords: Covid 19 - Trade Openness - Final Government Expenditure - Final Household Expenditure - General Consumer Price Index - Multiple Regression Model.

Introduction

Today, the world is experiencing a reality that has not been witnessed before, due to the coronavirus pandemic "Covid 19", which constitutes a major turning point for all countries. not only because of its seriousness to human health but also because of the widespread economic repercussions that this health crisis will entail, reflecting shocks to supply and demand that directly and indirectly affect international transactions and thus the emergence of an unexpected global economic crisis, which affected everyone.

The Corona crisis differs from previous crises to which economies have been exposed before because it is more severe and dangerous; it combined being an internal and an external shock. The shock of global demand: reduced demand for local products from countries of the world. The shock of global supply: reduced capacity of countries to supply the various products they

import. The shock of local demand: decrease in local consumption of various products. The shock of local supply: reduced production capacity of local factories to cover the needs of both the local and export markets. (Abdul Latif, Abla, 2020).

In the economic development theory, economic openness contributes to the possibility of economies of scale in production, because the expansion of the market through trade should lead to lower real costs of production. Experience has shown that open economies achieve a performance in growth and development that exceeds what was achieved in economies under protectionism. Considering, the great pressure on countries in general, as a result of social distancing measures and the suspension of economic activity almost country after country, this has caused a sharp global economic contraction and a near-total collapse of world trade (Saleh, Hussein 2020).

The policy of trade openness leads to the abandonment of biased policies against exports, the adoption of neutral policies between export and import, and the reduction of the value of high tariffs, in addition to the transformation of quantitative restrictions into tariffs and the trend toward a unified tariff system. Therefore, the content of the trade liberalization program includes many procedures with regard to import policies, export promotion policies, exchange rate policies, macroeconomic management policies, and regulatory and trade policies toward trade partners (Abdus, 2011)

Trade openness has many advantages, the most important of which is benefiting from the reduction of tariffs and the removal of non-tariff restrictions, which leads to increasing the competitive efficiency of products, including increasing the size of global markets through many changes in developed countries, decreasing the strength of central banks in controlling the value of currencies in developing countries, and reducing the monetary and fiscal policies of the government (Mui & others, 2018). The liberalization of merchandise trade may entail importing competition for domestic products, leading to a reduction in the size of industrial enterprises and consequently a rise in unemployment, with social and economic constraints. Under the pretext of respecting quality and health standards, developed countries are likely to resort to imposing the protection of their markets from the imports of developing countries (Dao, Anh, 2014).

The application of trade openness and import substitution may also have a negative impact on development and growth, because increased revenues lead to a deficit in the trade balance, which may be financed by external debt, and thus trade openness may be a cause of external indebtedness (Clement & others, 2017).

Through simultaneous shocks, the pandemic has caused not only reduced domestic but also external demand, lower oil prices, disrupted trade and global value chains, reduced consumer and investor confidence, and tightened financial conditions. Because of falling global demand, commodity prices and volumes have fallen. As a result, Gross domestic product (GDP) was severely affected in 2020.

Taking into account the strong containment measures implemented by economies as well as the turbulence in global supply chains and the structural characteristics of individual economies (OECD, 2020).

This research attempts to study the impact of the COVID-19 pandemic on trade openness in the Arab Republic of Egypt during the period 2015-2021 using the distributed time-gap auto gradient method (ARDL).

Study Plan

In the following section, the research is divided into previous studies, Research Methodology, Data Description, the standard model applied to the Egyptian economy, followed by the findings, recommendations, and finally the conclusion.

Previous studies

Several studies have dealt with the impact of Covid 19 on macroeconomic variables. One of these studies is (Maryla, Maliszewska, and others, 2020) study, which looked at estimating the potential economic costs of the pandemic and found that the loss due to Covid 19 is a drop in global GDP of up to 3.9%, and the developing countries were the hardest hit (4% on average, but some are more than 6.5%). Also, it is one of the effects of increasing the costs of local trade as well as shifting demand away from activities that require direct contact with other people.

In a study of (Osman, Mohammed Osman, 2020) that examined the Covid-19 pandemic and the fate of globalization between disintegration and confrontation, it analyzed the repercussions of the Covid-19 pandemic on the expected world conditions and the fate of globalization as well as the pattern of the global economic system, where it analyzed three possibilities for the fate of globalization and the global system. Either the possibility of returning to the situation before the crisis with some changes that can be corrected, or moving towards a review of the features of globalization that we have witnessed since the 1990s and benefiting from the possibility of lessons learned by the officials of that crisis, or the aggravation of differences between the greatest economic powers, which leads to increased polarization and an end to globalization.

According to the study (Erokhin & Gao, 2020), which dealt with the impact of Covid 19 on foreign trade, currency exchange fluctuations, inflation rates, and the risks of this on food security in its sample of 45 developing and least developed countries, and by using the (ARDL model, and Toda-Yamoto) To estimate the impact of variables, it reached three main results from testing hypotheses. First, the effects are more negative in the upper middle-income segment in the least developed countries. Second, in low-income developing countries, the risks are related to the food inflation coefficient. Third, food security risks are more prevalent in high-income developing countries, but in a lesser proportion of the least developed countries.

While (Nawaf Abu Shamalah, 2020) in his study on the economic effects of the "Covid-19" pandemic on labor markets and poverty in the Arab countries and ways to address them, assessed the role of labor market policies adopted by the Arab countries in general, especially during the crisis to reduce its effects. The study showed that during the first period of the crisis, the Arab countries faced the highest levels of job loss compared to the rest of the world according to the relative standard of loss in working hours. The analysis also showed that the structural imbalances in the labor market in the Arab countries deepened from the repercussions of the Covid-19 pandemic, especially in the high unemployment rates, the gap between wages and productivity, the weak ability to sustain job creation, the spread of work in the informal sector, and the failure to meet the requirements of decent work. It showed also, the need to apply several approaches that are based mainly on reorienting the course of economic growth to achieve a real reform of the structures of the economy and markets of the Arab States.

For (ESCWA, 2020) study, which presented the effects of the Covid-19 pandemic on Arab economies in terms of trade and foreign direct investment, the study found that the total exports of the Arab region are expected to decrease by 88 billion dollars as a result of Covid-19, and the decline of the total imports of the Arab region by 111 billion dollars, and comes to the mining and chemical industries at the forefront of the most losing sectors, so that 71 percent of the total decline in exports is recorded as well as the expected decline in imports and that the Arab region incurs losses of 20 billion dollars in tax revenues from indirect taxes.

In the study (Barlow & Others, 2021) I have found that there is an explicit link between trade and health. The huge size of the COVID-19 pandemic is a result of international trade and globalization. On the other hand, the pandemic is also affecting international trade through reductions in both supply and demand, which has led to recessions, threats to social safety nets, and increased income instability, employment, and food security. The study recommended that trade policy needs to understand its relevance to health to ensure maximization of benefits and reduction of threats.

For (Zimmermann & Others, 2020), this study provided evidence that there is a positive relationship between the levels of globalization and trade openness in countries and the speed of transmission of the Coronavirus and that epidemics can be contained through early measures of temporary distancing between countries and exploiting periods of distancing and isolation in investment in health infrastructure, which makes countries richer, and more competitive after crises.

The current research differs from the previous studies conducted in terms of choosing the study variables and the period. As the current study tries to estimate the impact of the Covid 19 pandemic on the commercial openness in the Arab Republic of Egypt specifically during the period 2015-2021 as a broad period that shows the comparative impact between the pre-pandemic and during the pandemic to cover the impact of favorable and unfavorable factors, with the introduction of both final government spending, final household spending, and the general consumer price index as independent variables controlled using the self-regression method with distributed time gaps (ARDL).

Research Methodology and Data Description

- **Description of variables and research period**

In order to determine the impact of COVID-19 pandemic on commercial openness, the study adopted when choosing variables on the theoretical side of previous studies and provides data for annual and monthly time series during the study period. Although these variables differ from one study to another, the study was chosen according to the goal of being included in the form as follows:

- Dependent variable: Trade openness and its acronym (Open)
- Independent variable: Number of COVID-19 infections and its acronym (Covid)

Controlling Independent Variables

1. Final expenditure for government public consumption (% of GDP) (GOV).
2. Final Household Consumption Expenditure (% annual growth) (PRIV)
3. Consumer Price Index (CPI)

**Table (1):
Study variables and data sources**

Variables	Shortcode	Indicator	Data sources
trade openness	OPEN	Trade (% of GDP)	Egyptian Central Bank
COVID-19	COVID	The number of COVID-19 cases	World Bank data
government consumption	GOV	Final Expenditure for Government Public Consumption (% of GDP)	
household consumption	PRIV	Household consumption final expenditure (% annual growth)	WTO
Consumer Price Index	CPI	General Consumer Price Index	WORLD BANK

The study will be applied to one country: the Arab Republic of Egypt, during the study period from 2015 to 2021.

The standard form of application to the Egyptian economy:

To measure the impact of the Covid-19 pandemic on trade openness in the Arab Republic of Egypt and this period was expanded to start from 2015 until 2021 so that the impact of this can be more clearly known. This study relied on The multiple regression model to express the relationship between the Covid-19 pandemic and trade openness and take the following form:

$$OPEN_t = f(COVID_t, GOV_t, PRIV_t, CPI_t) \dots \quad .(1)$$

The mathematical formula of the equation can be written in the following way:

$$lOPEN_t = \beta_0 + \beta_1 lCOVID_t + \beta_2 lGOV_t + \beta_3 lPRIV_t + \beta_4 lCPI_t + \varepsilon_t \dots (2)$$

ε_t has been inserted into the equation due to the probabilistic nature of the model.

• **Standard style description used:**

The study relied on the use of the distributed time-gap autogradient method (ARDL) developed by Pesaran et al. (2001) due to its accuracy in predicting whether the variables are zero degree I (0), one degree I (1) or a combination thereof. Based on the above and in practice, the error correction and boundary test model is done after determining the degree of stability of the study variables, and therefore the applied model takes the form of the following equation:

$$\begin{aligned}
 \Delta LOPEN_t = & a_0 + \sum_{i=0}^M a_{1i} \Delta LOPEN_{t-1} \\
 & + \sum_{i=0}^{N1} a_{2i} \Delta LCOVID_{t-i} + \sum_{i=0}^{N2} a_{3i} \Delta LGOV_{t-i} \\
 & + \sum_{i=0}^{N3} a_{4i} \Delta LPRIV_{t-i} + \sum_{i=0}^{N4} a_{5i} \Delta LCPI_{t-i} \\
 & + \beta_1 LOPEN_{t-1} + \beta_2 LCOVID_{t-1} \\
 & + \beta_3 LGOV_{t-1} + \beta_4 LPRIV_{t-1} + \beta_5 LCPI_{t-1} \\
 & + \varepsilon t \dots (3)
 \end{aligned}$$

Where:

Δ = The first differences in the values of the study variables.

α_0 = The constant of the equation.

M = Number of time lags of dependent variable.

N = Number of time lag periods for independent variables.

$a_{4i}, a_{3i}, a_{2i}, a_{1i}$ = (short-run relationship).

$\beta_4, \beta_3, \beta_2, \beta_1$ = (long-run relationship)

The imposition of nullity shall be: $H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$

Alternative hypothesis: $H_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$

t = Time

εt = Random error limit

Standard Study Results

Firstly: unit Root Tests (Phelps_Byron test) (PP)

The results of the Philips-Pyron (PP) test indicate that the time series of variables are static when taking the first difference, and this is indicated by the calculated value of (τ), which was greater than the tabular values at a significant level (1%, 5%, 10%), that is, the variables are static of one degree

Table (2)
Philips-Pyron test results (PP) for time series data during the study period

variable	the level	Calculated value	Table value at level 1%	Table value at level 5%	Table value at level 10%
OPEN	at level	-1.3073	-3.6702	-2.9639	-2.6210
	First Variance	-	-3.6793	-2.9677	-2.6229
COVID	at level	-2.6011	-3.6702	-2.9639	-2.6210
	First Variance	-	-3.6793	-2.9677	-2.6229
GOV	at level	-0.9498	-3.6702	-2.9639	-2.6210
	First Variance	-***23.3161	-3.6793	-2.9677	-2.6229
PRIV	at level	-1.4509	-3.6702	-2.9639	-2.6210
	First Variance	-	-3.6793	-2.9677	-2.6229
CPI	at level	-1.2807	-3.6702	-2.9639	-2.6210
	First Variance	--	-3.6793	-2.9677	-2.6229

(*) Static at significance level 10%, (* *) Static at significance level 5%,
(* * *) Static at significance level 1%

Source: by the researcher based on the statistical program Eviews12

Second: Estimation of Distributed Time Gap Self-Delay Model (ARDL):

➤ Optimal Slowing Periods Test:

It is noted that the number of optimal slowdown periods is (1) by adopting the AIC and SC standards from Table (3).

Table (3)
Slowdown Period Selection Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
·	136.2355	NA	4.53E-12	-11.93050	-11.68254	-11.87209
\	267.1281	190.3892*	3.21E-16*	-21.55710*	-20.06932*	-21.20662*

Source: by the researcher based on the outputs of the statistical program Eviews12

Test (LM Test) for Residual Self-Correlation Problem

To determine the optimal number of time lags, the (AIC) criterion concluded that the optimal number that rids the model of the problem of self-linking of the remainder is (1, 1, 1, 1, 1) as shown in the following figure:

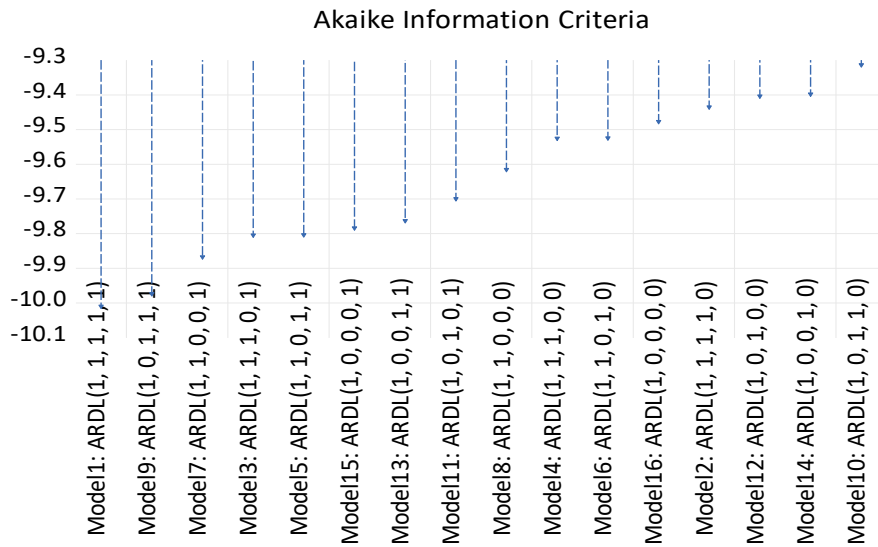


Fig. 1 Optimal number of time lags for study variables

Source: by the researcher based on the outputs of the statistical program Eviews12

Table (4)
Estimate of the self-regression model with distributed time gaps (ARDL)

Dependent Variable: LOPEN
Method: ARDL
Sample (adjusted): 2020M03 2021M12
Selected Model: ARDL(1, 1, 1, 1, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOPEN(-1)	0.878305	0.019083	46.02506	0.0000
LCOVID	-0.000930	0.000485	-1.918188	0.0792
LCOVID(-1)	0.000421	0.000331	1.273189	0.2271
LCON_GOV_EGP	-0.029431	0.009953	-2.957074	0.0120
LCON_GOV_EGP(-1)	-0.021422	0.010521	-2.036226	0.0644
LCON_PRIV_EGP	-0.032497	0.011295	-2.877012	0.0139
LCON_PRIV_EGP(-1)	-0.025430	0.012513	-2.032339	0.0649
LCPI	0.253001	0.068773	3.678778	0.0032
LCPI(-1)	0.259833	0.077137	3.368439	0.0056
C	-1.317339	0.101111	-13.02867	0.0000
R-squared	0.999176	Mean dependent var	3.518189	
Adjusted R-squared	0.998558	S.D. dependent var	0.036708	
S.E. of regression	0.001394	Akaike info criterion	-10.01027	
Sum squared resid	2.33E-05	Schwarz criterion	-9.514340	
Log likelihood	120.1130	Hannan-Quinn criter.	-9.893443	
F-statistic	1616.552	Durbin-Watson stat	1.896474	
Prob(F-statistic)	0.000000			

Source: prepared by the researcher based on the outputs of the statistical program Eviews12

Table 4 indicates that the results of the regression equation test showing the relative quality of the estimated statistical model, which includes the trade openness index as a dependent variable and indicators (Covid-19 cases, final government spending, final household spending, general consumer price index) as independent variables. This is through the high value of the corrected selection coefficient where it was valued (=0.99), which means that the model explains 99% of the changes in trade openness, and that the results of the relationship are not false. This is supported by the fact that the value of Durbin Watson DW=1.896 came above the value of the selection factor, and the value and morale of the F-statistic statistics indicate that the overall moral model is at a level below 1%, so the model can be relied upon in economic analysis.

➤ **Tubal Chain Stability Test**

In order to estimate the model, the stability of the trumpet chain at the level must be studied by the Dickie-Fuller Test (ADF) because the time series of study variables are static at the first difference.

Table (5)
Results of the trumpet stability test for study variables

variable	level	Calculated Value	moral level prob
Trumpet Series (ECT)	at level	-***6.171269	0.0001
variable	First Variance	-7.943414***	0.0000

(*) Static at significance level 10%, (**) Static at significance level 5%, (***) Static at significance level 1%

Source: by the researcher based on the statistical program Eviews12

The results in table 5 indicate that the series of condoms of study variables is stable at the level, and therefore the study model can be estimated.

➤ **Diagnostic tests for the credibility of model**

In order to adopt the study model in estimating long- and short-term effects, its quality must first be ascertained, through the following tests:

- 1- (ARCH) test to detect the problem of variability homogeneity between trumpets. Arch test was conducted to verify the homogeneity requirement, and the results were as shown in table 6, which indicates that the value (F-statistic) is equal to (0.345243) with a probability (0.5637), which is greater than the moral level (5%). So, the imposition of nothingness cannot be rejected (that there is a homogeneity of variance between the trumpets).

Table (6)
(ARCH) TEST

Heteroskedasticity Test: ARCH

F-statistic	0.345243	Prob. F(1,19)	0.5637
Obs*R-squared	0.374775	Prob. Chi-Square(1)	0.5404

Source: prepared by the researcher based on the statistical program Eviews12

1) (LM Test) to detect the problem of self-association between the trumpet

Table (7) indicates that the value (F-statistic) is equal to (0.002219) with a probability (0.9633) which is higher than the moral level (5%), which indicates the acceptance of nihilistic or zero imposition (lack of self-association between the trumpets).

**Table (7)
(LM Test)**

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.002219	Prob. F(1,11)	0.9633
Obs*R-squared	0.001138	Prob. Chi-Square(1)	0.9469

Source: prepared by the researcher based on the statistical program Eviews12

i. Natural Test the Distribution

The requirement for the natural distribution of the tubal is an expression of the extent to which the form is accepted or rejected. The following Fig. (2) shows that the value (Jarque-Bera) was (0.159) and probability (Prob=0.92), a value greater than the level of indication (5%), thus accepting the zero imposition that the trumpet follows the natural distribution.

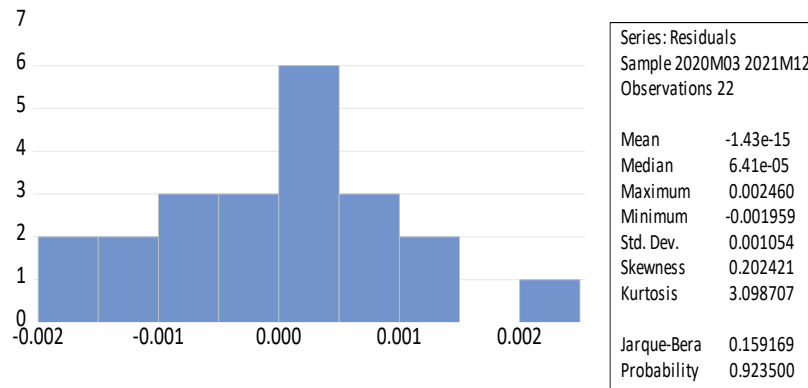


Fig. 2 Natural Test the Distribution

Source: prepared by the researcher based on the statistical program Eviews12

(1)(CUSUM Test & CUSUM of Squares Test) for model stability

Based on the CUSUM Test & CUSUM of Squares Test, the structural stability of the estimated model parameters is achieved if the graph falls within critical boundaries at a moral level (5%). Figure 3 shows that the estimated model is structurally stable during the study period.

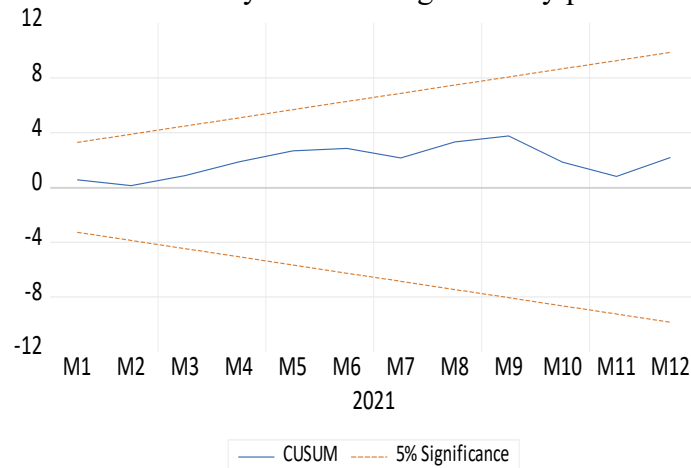


Fig. 3 Cumulative Total of The Pye (CUSUM)

Source: prepared by the researcher based on the statistical program Eviews12

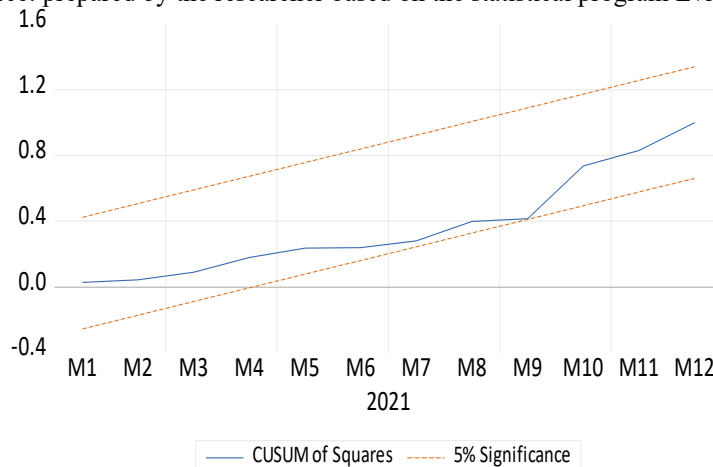


Fig. 4 Total Cumulative Squares of Squares (CUSUMK of Squares)

Source: prepared by the researcher based on the statistical program Eviews12

(1) Predictive Capability Test for Unrestricted Error Correction Model

The inequality coefficient, valued at about 0.0001, is used as a near-zero value, reflecting the model's predictability.

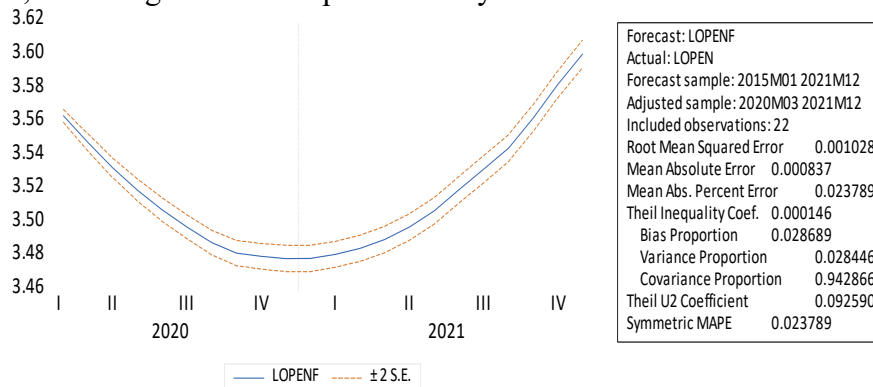


Fig. 5 Predictive Capability Test for Unrestricted Error Correction Model
Source: prepared by the researcher based on the statistical program Eviews12

➤ Bounds Test

Bounds Test is used to verify a long-term relationship. Owing to table 8, we find that a statistical value (F) is equal to (197.8553) which is higher than the table values at a minimum level The indication (1%) which equals (3.74) alone is higher at the same level (5.06), thus refusing to impose nothingness and accepting alternative imposition. So, this means that there is a common balance and integration relationship between the trade openness index and independent variables during the study period.

Table 8
Border Test Results

Test Statistic	Value	K
F.Statistic	197.8553	4
Critical Value Bonds		
Upper Limit	Minimum	Significance
3.52	2.45	1%
4.01	2.86	5%
4.49	3.25	10%
5.06	3.37	1%

Source: prepared by the researcher based on the statistical program Eviews12

➤ **Estimate of the long-term relationship between study variables:**

Table 9 below shows that there is a long-term non-moral impact between trade openness and covid-19 cases, meaning that this effect is not significantly apparent on long-term trade openness. Meanwhile, the results have shown a negative and moral impact between both final government spending (GOV) and final household spending (PRIV) on one side and trade openness (OPEN) on the other, and this negative and moral impact came at a significant level (1%, 5%, 10%) on the other, respectively.

The results also showed that there was a positive and moral impact at the same time between the General Consumer Price Index (CPI) and trade openness at a moral level (1%, 5%, 10%).

Table 9
Results of estimating the long-term relationship between variables according to ARDL

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCOVID	-0.004186	0.003105	-1.348236	0.2025
LGOV	-0.417871	0.082525	-5.063544	0.0003
LPRIV	-0.476000	0.059507	-7.999036	0.0000
LCPI	4.214075	0.524202	8.039024	0.0000

Source: prepared by the researcher based on the statistical program Eviews12

The equation of the long-term relationship can be written as follows:

$$EC=LOPEN-\{0.0042(LCOVID)-0.4179(LGOV)-0.4760(PRIV)+4.2141 (LCPI)\}$$

➤ **Estimating Short-Term Relationship and Error Correction for ARDL**

Table (01) shows that the error correction coefficient takes a negative signal, which is a statistically significant signal at a significant level less than (1%) and its value was (-0.1216), which confirms that the macroeconomic system corrects short-term imbalances in the independent variables in the previous year to the current year by (12.16%) to reach the state of equilibrium in the long term.

The most important aspect of this result is the negative indication of the error correction coefficient, which is in line with the theory and shows evidence of convergence in the case of long-term imbalance. The value (-0.1216) means that the economic system takes approximately (8.22) years ($1/0.126 = 8.22$) to return to the equilibrium state, since the speed is very low. So, the lower the value of the error correction coefficient, the larger the correction period is and vice versa, which Dankumo et al (2019) supports. On the other hand, the results of the short-term parameters of the independent variables (number of Covid-19 infections, Final Government Expenditure (GOV, PRIV) household final expenditure, and CPI) are all significant, with a short-term correlation between the index of trade openness and these independent variables.

Table 10
Estimating Short-Term Relationship and Error Correction for ARDL

Short Run Coefficients				
Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	-1.317339	0.036279	-36.31168	0.0000
D(LCOVID)	-0.000930	0.000214	-4.354059	0.0009
D(LGOV)	-0.029431	0.006608	-4.453838	0.0008
D(LPRIV)	-0.032497	0.007918	-4.104024	0.0015
D(LCPI)	0.253001	0.055932	-4.523369	0.0007
CointEq(-1)*	-0.121695	0.003351	-36.31853	0.0000
R-squared		0.992352		
Adjusted R-squared		0.989962	Durbin-Watson stat	1.896474
F-statistic		415.2247		
Prob(F-statistic)		0.000000		

Source: prepared by the researcher based on the statistical program Eviews12

Finally, the short-term test shows that the correlation coefficient (R²) which estimated at (0.992) is an indication that 99.2% of changes in trade openness are calculated by changes in independent variables together.

➤ **Standard Study Results**

- The standard results of the study show that there is an impact of the Covid-19 pandemic on trade openness. It has been found that there is a negative impact or an inverse relationship between the number of Covid-19 infections and trade openness in the long term, but this effect is weak because of the lack of significance of the long-term impact. When the number of infections increases by (1%), this leads to a decrease (open) in the dependent variable by up to (0.0042%), and the Covid-19 pandemic has a strong negative impact (reverse relationship) in the short term, which is in line with economic theory. The increase in the number of infections by (1%) leads to a decrease in trade openness by up to (0.0009%).
- Final government spending has a strong and significant negative impact on trade openness in the short and long term. Once, government spending increases by (1%), this leads to a decrease in trade openness by (0.0294%) in the short term and by (0.4178%) in the long term.
- Also, the results showed that there is a strong negative impact (inverse relationship) of household spending on trade openness in the short and long term. When household spending increases by (1%), trade openness decreases by (0.0324%) in the short term and by (0.467%) in the long term.
- The general consumer price index has a strong positive impact on trade openness in the long and short term. When the general price index increases by (1%), trade openness increases by (0.253%) in the short term and by (4.214%) in the long term.

■ **Recommendations:**

In light of the above findings, the study recommends the following:

- Action needed to be taken with regard to import and export restrictions, in particular on food, medical products and inputs for commodity-producing industries. And thus, for promoting international trade and reducing its vulnerability to the crisis, and joining appropriate programs to support exporters and importers at the regional and international levels.
- Coordinating the efforts of ministries and agencies related to data collection such as the Ministry of Planning and Economic

Development and the Central Agency for Public Mobilization and Statistics to ensure the consistency of data of important price time series and their developments such as the producer price index, export and import prices, and GDP deflator. Improving the measurement of these prices helps to conduct a more accurate analysis of real versus nominal changes in GDP components.

- Reviewing the priorities in public and private spending in order to qualify the Egyptian economy to overcome the current crisis which leading to the reduction of trade openness and interest in projects that serve sustainable and national productive activities with international specifications to ensure that they come out with high quality levels capable of keeping pace with the developments of demand not only at the local level but also at the regional and global levels.
- Redirecting public spending away from housing and real estate to more important investments such as the health care sector to accelerate overcoming the crisis, digital infrastructure and work to develop e-commerce to ensure sustainability. And working on building bridges with alternative markets, and launching public-private partnerships to increase investment in the manufacturing sector with an export orientation or import substitution goals.

Conclusion

- The research focused on studying the impact of the Covid-19 pandemic on trade openness in the Arab Republic of Egypt during the study period using the distributed time-gap auto regression method (ARDL).
- The results indicate the significance of the model as a whole, and this is supported by the coming of a statistical probability value (F-statistic) at a level of significance (1%), which indicates that the model is fully significant.
- Standard results of the study showed an impact of the COVID-19 pandemic on trade openness.
- The study indicates that there is an inverse relationship in the long and short term between both the number of COVID-19 infections and public government spending and final household spending on the one hand and trade openness on the other. Also, it proves that there is a strong direct relationship between the consumer price index and trade openness in the short and long term.

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تأثير جائحة كوفيد-١٩ على الانفتاح التجاري في مصر: دراسة قياسية

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المخلص

تحاول هذه الورقة قياس تأثير جائحة كوفيد-١٩ على الانفتاح التجاري في جمهورية مصر العربية مع ادخال كل من الإنفاق الحكومي النهائي، إنفاق الأسر النهائي، والرقم القياسي العام لأسعار المستهلك كمتغيرات مستقلة ضابطة باستخدام بيانات لسلاسل زمنية Time Series سنوية وشهرية خلال الفترة ٢٠١٥-٢٠٢١ كفترة زمنية واسعة توضح الأثر المقارن بين ماقبل وخلال الجائحة وذلك باستخدام أسلوب الانحدار الذاتي ذي الفجوات الزمنية الموزعة (ARDL) المطور من قبل Pesaran et al (٢٠٠١) لاختبار العلاقة طويلة الأجل بين المتغيرات والعلاقة الديناميكية في الأجل القصير من خلال تطبيق نموذج الانحدار المتعدد (Multiple Regression Model).

وقد أوضحت النتائج وجود علاقة عكسية في الأجلين الطويل والقصير بين كل من عدد إصابات كوفيد-١٩ والإنفاق الحكومي العام وإنفاق الأسر النهائي من جهة والانفتاح التجاري من جهة أخرى، وأن هناك علاقة طردية قوية بين الرقم القياسي لأسعار المستهلك والانفتاح التجاري في الأجلين القصير والطويل.

الكلمات المفتاحية: كوفيد ١٩ _ الانفتاح التجاري _ الإنفاق الحكومي النهائي _ إنفاق الأسر النهائي _ الرقم القياسي العام لأسعار المستهلك _ نموذج الانحدار المتعدد (Multiple Regression Model).