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# The Impact of The Budget Deficit on The Private Investment in Egypt

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***Abstract:***
*For the last ten decades, private investment in Egypt has been low. Given that investment is a major variable influencing economic growth, this has caused policymakers considerable concern.Fiscal policy has been a major focus in this direction. This paper presents the relationship between the private investment and the budget deficit in Egypt.The Autoregressive Distributed Lag Model (ARDL) and Bounds test were used for the cointegration approach, with time series annual data from 1990 to 2020, which gives results for a long run relationship.Using the budget deficit as the primary explanatory variable, the empirical results revealed a negative and significant relationship between the budget deficit and private investment in both the short and long run. Results can be summarized as following: (BD) and (HCE) is negatively associated with the private investment, and Surprisingly, (INF) positively associated with the private investment in Egypt. The study concludes that appropriate measures should be taken when developing a fiscal policy framework to ensure that, as other government objectives are met, private investment growth is considered.*

***Key Word****:Private investment; Budget deficit; ARDL; Egypt.*

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## I. Introduction

The primary goal of any government is to achieve macroeconomic goals such as long-term economic growth, low and manageable unemployment, internal and external stability. Governments use fiscal, monetary, and trade policies to try to achieve these goals. Fiscal policy is the study of government spending and revenue in order to monitor and influence the economy by lowering unemployment rates, stabilising business cycles, and controlling inflation and interest rates(Kalugalla, 2020).

Egypt, like many other developing countries, has faced structural issues that have harmed its financial position and ability to implement a sustainable fiscal policy. This was reflected in the high ratios of Egypt's budget deficit to GDP over time. According to the Ministry of Finance's final state budget accounts and statistics, the total budget deficit in fiscal year 2019/2020 was approximately 7.8 percent of GDP.

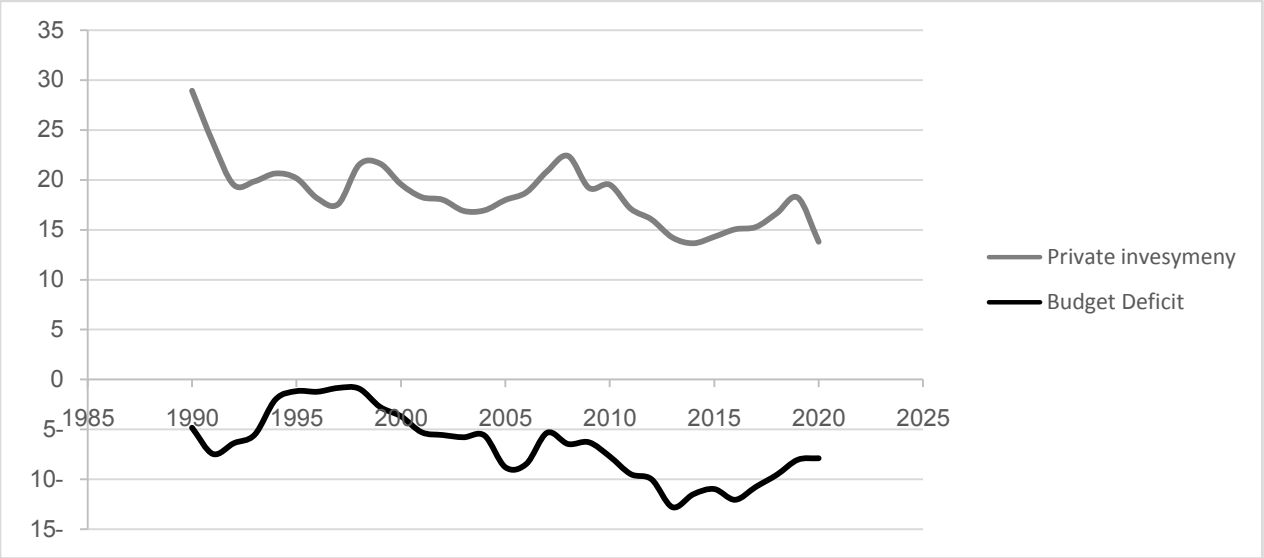
The public spending scheme in Egypt is rigid and inflexible.It is primarily aimed at achieving social welfare through wages and subsidies, which account for more than half of total expenditures.Because of the large stock of public debt, interest payments account for a sizable portion of expenditures(Shetta and Kamaly, 2014).

A budget deficit occurs when the government's spending exceeds its revenues. This deficit can be financed by printing money, depleting foreign exchange reserves, borrowing from abroad, and borrowing from domestic sources. The methods used to finance deficits have a direct impact on resource allocation and macroeconomic activities.One method of financing the budget deficit is to issue domestic debt instruments. When the government borrows more, the private sector's available financial facilities shrink, putting pressure on interest rates (Apere, 2014).

As a result of the fiscal deficit, national savings will plummet, as will domestic investment. The fiscal deficit causes macroeconomic imbalances, and an expansionary fiscal policy inevitably leads to a contraction of the private sector, resulting in lower private investment and consumption (Mankiw, 2009).

In most economies, private investment is the most important driver of economic growth and development. This is due to the fact that through private investment, new inventions can be adopted, employment opportunities can be created, incomes can grow, and people's standard of living can improve, eventually leading to poverty alleviation (Matwanga, 2000).

**Figure 1** Budget deficit and private investment in Egypt (1990-2020)




**Source**: Egyptian Ministry of Finance and World Bank data.

Figure 1 shows the trend of government budget deficit and private investment from 1990 to 2020 in Egypt. Private investment in Egypt has a growing trend during the period of 1990 to 2010. In the year 2010, it reached a peak of 20 percent of GDP. After that, there is a moderate decline between 2011 and 2018. Private Investment has experienced a little fluctuation by the year 2019 then it has maintained the same level up to 2020.

According to the final accounts of the state budget, there was a considerable deviation in fiscal deficit during the past few years. It has decreased to 7.8 percent in 2020 from 12.7 percent in the year 2013 as a percent of GDP. This is basically due to the increasing trend of the economic growth.

Some researchers argue that as the budget deficit grows, it will be covered by borrowing funds both externally and internally.As a result of this increase in government expenditure, which is met by borrowing from capital markets (Analizi, 2011), interest rates rise, potentially increasing borrowers' cost of capital.This will eventually hinder private-sector investment. Thus, the study problem is summarized in the following question: what is the impact of the budget deficit on the private investment in Egypt?

The objective of this study is to evaluate the impact of the budget deficit on the the private investment, assess the relationship between the budget deficit and the private investment and from the results, the studies propose suitable solutions.

## II. Literature Review

- **Theoretical Review**

This section provides a summary of the major theoretical arguments about the relationship between private investment and fiscal policy.In general, economists look at the aggregate effects of fiscal policy from one of three perspectives.While the neoclassical model advocates crowding-out, the Keynesian school argued that an increase in government spending promotes domestic economic activity and crowds-in private investment; the Ricardian Equivalence Theorem emphasizes that increases in the deficit financed by fiscal spending will be matched by a future increase in taxes, leaving interest rates and private investment unchanged (Bahmani-Oskooee, 1999).

According to the Neoclassical Loanable Funds Theory, the interest rate mechanism balances savings and investment. This mechanism's malfunctioning or slow operation is attributed to short-term fluctuations in employment and output (Grieve, 2004). In the case of an increase in government spending, interest rates must rise to bring the capital market back into balance, dampening private investment. (Heijdra and Ligthard, 1997; Voss, 2002; and Ganelli, 2003).

The Keynesian viewpoint, on the other hand, assumes that the economy is usually unemployed and that interest rate sensitivity of investment is low. In that case, expansionary fiscal policy will result in little or no interest rate increases, as well as an increase in output and income. Furthermore, this viewpoint assumes that government spending increases private investment because government spending raises investors' expectations. As a result, there is crowding in rather than crowding out. Many traditional Keynesians argue that government deficits do not have to crowd out private investmentat any given rate of interest (Aschauer, 1989b; Baldacci, et al., 2004).

This section includes Eisner (1984), who believes that increased aggregate demand improves the profitability of private investments and thus leads to increased investment. A number of studies, inspired by the work of Barro (1991), have argued that certain types of public spending, such as public investment, may be conducive to private investment and growth According to Saleh (2003), depending on the relative strength of two opposing forces, public capital crowds out or crowds in private capital: (1) as a substitute in production for private capital, public capital tends to crowd out private capital; and (2) by raising the return on private capital, public capital tends to crowd in private capital.Furthermore, Aschauer (1989a, 1989b) contends that higher public investment increases the national rate of capital accumulation above the level chosen (in a presumed rational fashion) by private sector agents; thus, public capital spending may crowd out private capital expenditures on an ex ante basis as individuals seek to re-establish an optimal intertemporal allocation of resources.On the other hand, public capital, particularly infrastructure capital such as highways, water systems, sewers, and airports, is likely to have a complementary relationship with private capital.

As a result, increased public investment may raise private capital's marginal productivity, thereby "crowding in" private investment. Finally, Barro (1974) proposed the Ricardian Equivalence Theorem, which assumes that asset holders completely discount future tax liabilities implied by deficits. This implies that budget deficits are unimportant in making financial decisions. In other words, a deficit caused by a lump-sum tax cut today followed by a lump-sum tax increase later will be fully offset by an increase in private saving, because taxpayers recognise that the tax is only postponed, not cancelled. Because of the offsetting increase in private saving, the deficit has no effect on national saving, interest rates, exchange rates, future domestic production, or future national income. (Gale and Orszag 2004).

The impact of the method of financing the deficit on private investment and growth has been studied in the literature; for example, Premchand (1984) claims that financing the budget deficit through public borrowing implies an increase in the supply of government bonds. To make these bonds more appealing, the government offers them at a lower price, resulting in higher interest rates. Interest rate increases discourage the issuance of private bonds, private investment, and private spending. Thus, this contributes to the financial crowding out of the private sector (price channel).

Heng (1997) developed a theoretical framework for analysing the issue of "crowding-in" of private capital by public capital using an overlapping-generations (OLG) model. He shows how public capital crowds out private capital through two channels: its impact on labour and savings marginal productivity, and the (gross) complementarity/substitutability of public and private capital.

- **Empirical Literature Review**

Dantama et al. (2017) examined the relationship between the Nigerian budget deficit and private investment using annual data from 1980 to 2014. they used the Johansen cointegration test and the Error Correction Model (ECM). The unit root test revealed that both series exhibit unit root at the level value and become stationary after the first difference, which is I(1), whereas the Johansen result suggests one coingration vector at the 5% significant level. According to the ECMt-1 result, 38 percent of errors were corrected from short run adjustment to long run adjustment. It also demonstrates that a unit increase in the fiscal deficit, government revenue, and exchange rate crowd in private investment by 0.0003, 0.276, and 0.205 percent, respectively, while a unit increase in government spending crowds out private investment by -0.570 percent in the long run.

Olanipekun (2020) examined the impact of Nigeria's budget deficit on investment from 1980 to 2015. This study examines the impact of the fiscal deficit on investment in Nigeria in general, as well as the impact of the fiscal deficit on private domestic investment, foreign direct investment, and the relationship between private domestic investment and public investment. The study employs Dale Jorgenson's neoclassical investment theory. The econometric evidence suggests that a fiscal deficit has a short-term negative effect on private domestic investment. However, a fiscal deficit has a long-term positive effect on foreign direct investment. In Nigeria, public and private domestic investment are separate entities.

Ahmed and Alamdar (2018) investigated the impact of corruption and budget deficits on private investment in Pakistan between 1984 and 2015. The study's findings supported the crowding out effect of the budget deficit. Furthermore, the findings show that corruption has a significant negative impact on private investment. Based on the findings of the study, it is suggested that the government make efforts to reduce the budget deficit. The government should take strict measures to combat corruption, which has a significant negative impact on private investment and appears to be the main constraint to development.

Kalugalla et al. (2020) used a multiple linear regression model to examine the relationship between budget deficit and private investment in Sri Lanka from 1990 to 2015. The purpose of this research is to determine the impact of the government budget deficit on private investments in the Sri Lankan context and to resolve the theoretical debate in the literature. The findings indicate that there is a positive relationship between

Sri Lanka's budget deficit and private investment. As a result, this study concludes that there is no crowding-out effect in Sri Lanka.

Mose et al. (2017) used the Modified Flexible Accelerator model to examine the impact of the budget deficit on private investment in East Africa from 1981 to 2015. According to the study's findings, the region's fiscal deficit has a negative impact on private investment. Debt reduction and government spending reduction strategies should also be implemented in the region to improve the fiscal deficit, thereby boosting private investment and accelerating real GDP growth in the long run.

## III. Research Methodology

### 3.1 Model Specification

The autoregressive distributive lag (ARDL) model has been used to test cointegration or long run relationship between budget deficit and private investmentand macroeconomic variables such as, inflation rate,Budget deficit and Household consumption expenditure.

This model is significant when it comes to model to variables of different integrated order**.** If F-statistics gives value that is that is greater than the lower critical values then can be conclude that there is cointegration between budget defecit and its determinants. but if F-statistic gives value less than the lower critical values it can be say that there is no cointegration.If we find cointegration then shall run error correction model (ECM), that the coefficient of CointEq (-1) should be negative and significant (Pesaran,1999).

The long-run relationship is measured according to the ARDL model, and the general formula for the long-run equation is as follows:

$PI_t=\beta_o+\beta_{o1i}PI_{t-i}+\sum_{i=o}^{q}\beta_{2i}\,BD_{t-i}+\sum_{i=o}^{s}\beta_{3i}\,INF_{t-i}+\sum_{i=o}^{m}\beta_{4i}\,HCE_{t-i}+U_t$ .....(1)

Where,

$PI_{t-i}$ = Private investment as a percentage of GDP

$BD_{t-i}$ = Budget deficit as a percentage of GDP

$INF_{t-i}$ = Inflation rate

$HCE_{t-i}$ = Household consumption expenditure as a percentage of GDP

β0 = Constant

β1, β2 and β3 are the coefficients

$U_t$ = = Error term

t = Time trend.

### 3.2 The Data

Data required for this study are private investment (proxied with gross fixed capital formation) scaled by GDP (PI), and macroeconomic variables such as, inflation rate (INF), Budget deficit as a percentage of GDP (BD), and Household consumption expenditure as a percentage of GDP (HCE). The estimation sample is from 1990 to 2020, for a total of 31 yearly observations.The data of PI, HCE and INF were obtained from World Bank, while BD is sourced from The Egyptian Ministry of Finance**.**

### 3.3 Descriptive Statistics

Table 1
Descriptive Statistics

| variables | N | Mean | SD | Min | Max |
|---|---|---|---|---|---|
| PI | 31 | 18.51924 | 3.21673 | 13.64319 | 28.91441 |
| BD | 31 | 6.620207 | 3.407122 | 0.860823 | 12.78515 |
| INF | 31 | 10.01766 | 5.970417 | 2.269757 | 29.50661 |
| HCE | 31 | 76.80532 | 4.821132 | 70.60062 | 88.12392 |

**Source:** Author's calculations, by Eviews

Descriptive statistics of sample data shows that the average value of growth rate of private investment is 18.5%, and growth rate of budget deficit has the average value of 6.6%, inflation rate has average value 10% and Household consumption expenditure has average value 78.8%.

## IV.Analysis and Discussion of Findings

Before carrying out the ARDL or Bounds test to cointegration, unit roots test was first conductedin order to examine the stationarity properties of the variables in the study.

- **Unit Root Test**

Table2
Unit Root Test

| | Level | | level | |
|---|---|---|---|---|
| variable | Augmented Dickey Fuller (ADF) | | Philipis-Perron | |
| | constant | Constant&trend | constant | Constant&trend |
| PI | -3.5918** | -4.1002** | -3.5458** | -4.0858** |
| BD | -1.2645 | -1.8261 | -1.3926 | -1.9566 |
| INF | -2.9954** | -3.0164** | -2.9135* | -2.8191 |
| HCE | -0.5941 | -3.7277** | -0.4589 | -1.4429 |
| | 1st Difference | | 1st Difference | |
| | constant | Constant&trend | constant | Constant&trend |
| PI | -4.4044*** | -4.0528** | -5.4683*** | -4.4158*** |
| BD | -4.9638*** | -4.8832*** | -4.9979*** | -4.9202*** |
| INF | -6.7312*** | -6.6341*** | -7.3337*** | -7.4420*** |
| HCE | -6.0309*** | -6.0251*** | -6.02965*** | -6.0883*** |

**Source**: Author's calculations, by Eviews

Note: ***, **, *denotes rejection of the hypothesis at 1%, 5% and 10%

From the previous table, we note that some variables are stationary at their levels and others are stationary at the first differences, and therefore the ARDL methodology can be used to estimate the model.

- **Correlation matrix**

Table 3
Correlation matrix

| | PI | BD | INF | HCE |
|---|---|---|---|---|
| PI | 1.00000 | -0.558877 | 0.149547 | -0.653485 |
| BD | -0.558877 | 1.00000 | 0.329433 | 0.504245 |
| INF | 0.149547 | 0.329433 | 1.00000 | 0.221841 |
| HCE | -0.653485 | 0.504245 | 0.221841 | 1.00000 |

**Source:** Author's calculations, by Eviews

According to the correlation matrix shown in Table 3, the independent variables have a weak correlation with each other. As a result, we can conclude that the model is free of multicollinearity problem.

- **Optimal lag length**

Table 4
Choosing the optimal lag length

| Lag Length | HQ | SC | AIC | FPE | LR |
|---|---|---|---|---|---|
| 0 | 21.04458 | 21.17164 | 20.98481 | 15266.25 | NA |
| 1 | 18.27076* | 18.90606* | 17.97193* | 759.7387* | 101.9887* |

**Source**: Author's calculations, by Eviews

From the previous table, we note that there are four statistics confirming that the optimal slowdown period is one period: {Lag=1}, being significant for the largest number of differentiation criteria (FPE, AIC, HQ, LR).

- **ARDL Bounds Test**

Table 5
Cointegration Test

| F-Statistic: 7.85 | Bound Critical Value (no trend) | |
|---|---|---|
| Significant Level | I(0) | I(1) |
| 10% | 2.37 | 3.2 |
| 5% | 2.79 | 3.67 |
| 2.5% | 3.15 | 4.08 |
| 1% | 3.65 | 4.66 |

**Source**: Author's calculations, by Eviews

As we refer to the table 5, the F-statistics (7.85) is more than the upper bound (4.66) at 1% significance level. therefore we can say that there is long-run cointegration (relationship) between the variables.

- **Coefficients Result**

Table 6
Long Run Coeffients Result

| Lag Structure | (1.0.0.1) |
|---|---|
| Dependent variable | PI |

| Independent variable | Coefficient | (Prob.) |
|---|---|---|
| BD | -0.4199 | 0.0044 |
| INF | 0.1781 | 0.0190 |
| HCE | -0.2333 | 0.0240 |
| C | 37.0814 | 0.0000 |
| $R^2$ | 0.79 | |

**Source**: Author's calculations, by Eviews

According to the result, we can conclude that the Budget deficit has negativeeffectonprivate investment in the long run, the coefficient is (-0.4199) shows that a 1 percentage point increase in budget deficit will cause a 42 percentage point reduction in private investment; Surprisingly,inflation rate has positive effect on budget deficit with coefficient of 0.1781, itcan be explained that at low to moderate inflation, specifically, below 65% for developing countries and below 42% for developed countries and inflation even has a significantly positive effect on the level of investment. (Li, 2006); and for Household consumption expenditure, it is negative and significant, and the coefficient is -0.2333, means that HCE have negative effect on budget deficit. we can conclude also, that ($R^2 = 79\%$), and this means that 79% of the changes in the private investment are explained by the variables included in the model in the Long Run.

- **Error Correction Model**

Table 7
Error Correction Model Result

| variable | Coefficient | Std.Error | Prob. |
|---|---|---|---|
| CointEq(-1)* | -0.635307 | -6.766789 | 0.0000 |

**Source**: Author's calculations, by Eviews.

According to the result,the Error Correction Coefficient (CointEq(-1)): It was significant, and had a negative sign. This corresponds to the conditions of applying the ARDL methodology to estimate the model.

- **The Quality and Suitabiltyofthemodelusedtests**

**1- Breusch-Godfrey Serial Correlatio LM Test**

Table8
LM Test Result

| | | | |
|---|---|---|---|
| F-Statistic | 0.438595 | Prob. F(2,14) | 0.5144 |
| Obs*R-Squared | 0.561376 | Prob.Chi Square(1) | 0.4537 |

**Source**: Author's calculations, by Eviews

In the Breusch-Godfrey Serial Correlation LM test for serial correlation, the P-value is 0.5144 which is greater than 0.05, so $H_o$ is not rejected at 5% significant level of confidence. Thus, there is no serial correlation in this model.

**2- Ramsey RESET Test**

Table 8
Ramsey RESET Test Result

| | Value | Df | Probability |
|---|---|---|---|
| t-statistic | 0.399831 | 23 | 0.69304 |
| F-statistic | 0.159865 | (1,23) | 0.6930 |

**Source**: Author's calculations, by Eviews

In the Ramsey RESET test for functional form and omitted variables, the P-value is 0.69304 which is greater than 0.05, so $H_o$ is not rejected at 5% significant level of confidence. Thus, there is no misspecification in this regression model.

**3- Structural stability test (CUSUM,CUSUMSQ)**

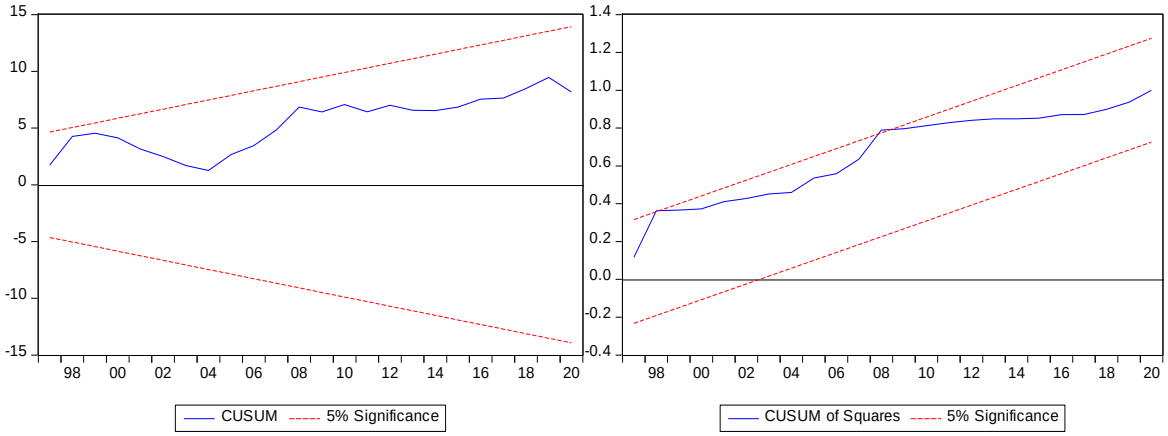



**Figure 2**: CUSUM and CUSUMSQ Test Result

By adopting CUSUM and CUSUMSQ test, we can view the stability test for long run model as shown in the graphs, confirming the stability in long and short run relationship between private investment and its determinants.(Brown et al, 1975)

**4- Heteroskedasticity Test: ARCH**

Table10
Heteroskedasticity Test Result

| | | | |
|---|---|---|---|
| F-Statistic | 0.559085 | Prob. F(1,26) | 0.4611 |
| Obs*R-Squared | 0.588316 | Prob.Chi Square(2) | 0.4431 |

**Source**: Author's calculations, by Eviews

In the ARCH test for heteroscedasticity test, the P-value is 0.4611 which is greater than 0.05, so $H_o$ is not rejected at 5% significant level of confidence. Thus, there is no heteroscedasticity in this regression model.

## V. Conclusion

This paper examines the relationship between the privateinvestment and the budget deficit in Egypt. The result found that the budget deficit has a negative and significant impact on privateinvestment in the long run and this confirms the economic theories. The Household consumption expenditure also showed that it has negative and significant impact on private investment. Surprisingly, we found that private investment and inflation are positively correlated. we contended that this finding is consistent with the interpretation that the income effect of inflation increases savings, the incomplete Fisher effect lowers the real cost of funds, and bond price movements caused by inflation increase real corporate wealth, all of which lead to higher, not lower, real investment.

The following policy implications have been developed based on the findings of the study. Adopting strict fiscal measures to reduce or cut all unnecessary and unhealthy government expenditures is necessary. For revenue collection, a strict and uniform policy must be implemented. This may help to reduce the size of the deficit. Adopting a strict national corruption control policy is critical at this time. The government is responsible for creating an environment that encourages private sector investment. Investors will be more confident if governance is improved, institutional quality is improved, and corruption practises among public sector officials are controlled.

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## Appendix A

### Table A.1. Bounds Test

Levels Equation
Case 2: Restricted Constant and No Trend

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| X1 | -0.419959 | 0.133432 | -3.147354 | 0.0044 |
| X2 | 0.178120 | 0.070798 | 2.515893 | 0.0190 |
| X3 | -0.233376 | 0.096844 | -2.409799 | 0.0240 |
| C | 37.08145 | 7.072802 | 5.242823 | 0.0000 |

EC = Y - (-0.4200*X1 + 0.1781*X2 -0.2334*X3 + 37.0814 )

F-Bounds Test — Null Hypothesis: No levels relationship

| Test Statistic | Value | Signif. | I(0) | I(1) |
|---|---|---|---|---|
| | | Asymptotic: n=1000 | | |
| F-statistic | 7.849618 | 10% | 2.37 | 3.2 |
| k | 3 | 5% | 2.79 | 3.67 |
| | | 2.5% | 3.15 | 4.08 |
| | | 1% | 3.65 | 4.66 |
| Actual Sample Size | 30 | Finite Sample: n=30 | | |
| | | 10% | 2.676 | 3.586 |
| | | 5% | 3.272 | 4.306 |
| | | 1% | 4.614 | 5.966 |

**Table A.2. Error Correction Model**

ARDL Error Correction Regression
Dependent Variable: D(Y)
Selected Model: ARDL(1, 0, 0, 1)
Case 2: Restricted Constant and No Trend
Date: 06/25/22 Time: 03:33
Sample: 1990 2020
Included observations: 30

ECM Regression
Case 2: Restricted Constant and No Trend

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(X3) | -0.387727 | 0.106788 | -3.630805 | 0.0013 |
| CointEq(-1)* | -0.635307 | 0.093886 | -6.766789 | 0.0000 |

| | | | |
|---|---|---|---|
| R-squared | 0.662877 | Mean dependent var | -0.504036 |
| Adjusted R-squared | 0.650837 | S.D. dependent var | 2.031693 |
| S.E. of regression | 1.200528 | Akaike info criterion | 3.267741 |
| Sum squared resid | 40.35551 | Schwarz criterion | 3.361154 |
| Log likelihood | -47.01611 | Hannan-Quinn criter. | 3.297625 |
| Durbin-Watson stat | 1.719342 | | |

Mosaad M.EL Gayish, et. al. "The Impact of the Budget Deficit on The Private Investment in Egypt." *IOSR Journal of Economics and Finance (IOSR-JEF)*, 13(4), 2022, pp. 56-64.