

Sustainable Development Determinants in Egypt: Does Governance matter?

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Introduction

Sustainable Development Goals (SDGs) are extensively guiding policies and funding for the next 15 years of its declaration to end hunger and poverty as the top of their priorities (Petrenko et al., 2017). Accordingly, development has been taken as a very complex, broad and multi-faceted connotation; where objectives transformed from only promoting growth to broadly promoting well-being.

As a consequence, GDP/GNI are no longer regarded as well-suited measures to development. This is conducive to expanding the usage of the indicators approach and identifying a tool to measure the progress towards achieving the SDGs (Parris & Kates, 2003). Adjusted Net Saving (ANS) is regarded as an important indicator to measure the degree of sustainable development (SD) of a country (See; Larissa et al., 2020; Hess, 2010; World Bank, website, <https://www.worldbank.org/>).

Importantly, governance principles have received a vital concern (Hanlin & Brown, 2013). This gave rise to place governance as the “fourth pillar of sustainable development,” according to Bowen et al. (2017).¹ In addition, Economic Freedom (EF) has been addressed as one of the main determinants that affect SD performance of a country (Mushtaq & Khan, 2018; Sofrankova et al., 2021). As a concept, it indicates that every human has a right to control labour and property, and thereby, greater prosperity could be brought about.

FD can yield a long term economic growth and transform saving into investments, which requires to increase access for finance and minimizes on the other side poverty and inequality.

Furthermore, since financing SD has nowadays become a crucial issue, literature has also tackled the relationship between achieving SD and particularly External Debt.

Literature reviewed

Literature revealed that governance and economic growth are positively correlated, specifically the democratic aspect. What's more, improving governance support government in investing more to improve governance, according to Chong and Calderón (2000)²

Glass & Jens Newig (2019) empirically explored governance arrangements for the SDGs implementation, applying to 41 high and upper-middle-income countries. A multiple regression has been used. According to the research, SDG achievement has been explained by democratic institutions, participation, economic power, and education and geographic location.

In a similar vein, Güney (2017) has quantitatively examined relationship between governance and SD (1996-2012) applied to 121 developed and developing countries. The research adopted the ANS to express the SD as a more holistic index that contain

¹ (<https://www.iddri.org/>).

² Gobel & Maslow (no date). https://www.sgi-network.org/docs/publications/Asia%20Study_Assessing_Pathways_to_Success.pdf.

the three pillar of sustainability. The results showed that the level of SD rises as the governance level is high in all countries. In addition, the effect of governance on SD in the developed is higher than in the developing ones.

Mushtaq & Khan (2018) investigated the effect of EF on SD, using SD index for 58 countries and contained 39 variables. Panel OLS has been applied for the years 2000-2015. A positive impact on SD has been found. Additionally, Dutta & Saha (2022) found that FD fosters eco-friendly investment, financial inclusion and economic growth and thus leads to SD.

On the other side, Afolabi, et al. (2022) explored foreign debt stock and foreign debt servicing influence on SDGs in Nigeria using OLS. The main finding was that foreign debt servicing considerably contributes to SDGs in Nigeria. In addition, as long as the cost of foreign debt outweighs its benefit, the research assured its negativity on the economy.

Other studies have explored the determinants of the SD using ANS (Pardi et al., 2015; Kaimuri & Kosimbei, 2017; Pardi, 2018). For example, Pardi et al. (2015), employed the Johansen test and VECM between 1971 and 2011 in Malaysia. The empirical results showed long-run and short-run relationships between the selected independent variables with the ANS.

Pardi and Nawi (2016) aimed empirically at investigating the factors that affect SD path in Malaysia during (1972-2011) using ARDL. The long run findings showed that total merchandise exports and the urban population tend to have a significant impact on the country's sustainability.

Furthermore, Kaimuri & Kosimbei (2017) applied ARDL to test the long-run and short-run relationships between SD and the variables that were expected to impact the SD in Kenya during (1991-2014). The estimation showed that household per capita consumption, unemployment and energy efficiency negatively affected the SD.

In a similar place, Pardi (2018) found that valuation exports of manufactured goods and natural resources were the most significant determinants for the SD. Additionally, Koirala & Pradhan (2019), in their research that applied to 12 Asian countries during the period (1990-2014), concluded that while GDP per capita and financial development positively affected SD, inflation and natural resources rent negatively impacted SD.

In a more recent research, Sofrankova et al., (2021) similarly investigated some determinants on the SD within EU countries (2011-2018) employing panel regression. The selected variables, focusing on the institutional factors. The results reveals that innovation, business environment, corruption and human development have influenced SD.

Research gap

It could be noticed, according to the literature reviewed, that the majority of the literature have paid lots of attention to the economic aspects that influence SD performance, the current research on contrary, focuses on the institutional factors that might affect SD performance in Egypt using some explanatory variables.

Table (1): Literature Review

Focus of analysis	literature
Explore the relationship between governance and SD	Güney (2017) - Glass & Newig (2019)
Explore the SD' other main requirements	Economic Freedom: (Mushtaq & Khan, 2018), External Debt: (Afolabi et al., 2022)

	(Sofrankova et al., 2021)
Explore the determinants of the SD using ANS	Pardi et al. (2015), Pardi and Nawi (2016), Kaimuri & Kosimbei (2017), Pardi (2018), & Koirala & Pradhan (2019)
Source: researchers	

Question, Hypotheses, and Objectives

In line with the above discussion, the current research addresses the following question: What are the main determinants of SD in Egypt? The work, therefore, tests a key hypothesis: there is a significant long-run relationship between SD, proxied by ANS, as a dependent variable, and some explanatory variables (External Debt, Governance, and Economic Freedom) that are seen as main determinants to the SD during (1996–2021). The data will be obtained from the World Bank, World Development Indicators (WDI), and other relevant sources.

Bearing in mind the above discussion, the purpose of this research is twofold: firstly, empirically investigate the influence of the main selected variables (External Debt, Governance, and Economic Freedom) on the SD achievement in Egypt during the period (1996-2021), which have never previously been applied to the Egyptian case during the period of analysis; secondly, formulate specific policy implications that help the decision maker to implement applicable policies to promote the achievement of the SD in Egypt.

To test the study’s hypothesis, the current research employs the ARDL & ECM to test both long-run and short-run relationships among these variables.

Sustainable development and governance, economic freedom, and external debt in Egypt.

SDGs have been accepted as an overarching theme to Egyptian development until 2030 to confront socio-economic challenges. By 2014, Egypt has embarked on establishing Egypt Vision 2030 under the participatory planning approach as the basis for formulating Egypt’s strategy and vision (MoPMAR, 2016).

Chart No. (1): updating strategy frame work (SDS)



According to the chart, enhancing the role of governance represents the sixth goal of the national goals. Recently, it has received a strong attention from the Egyptian government in order to enhance decentralization and implement local administration reform. Most importantly, the six national SDGs has been localized at the governorate level to improve the role of governance and enhancing accountability (MPED, VNR, 2021).

Source: constructed by the researchers, based on (MPED, VNR report, 2021).

Indicators related governance: SDG16 (peace, justice& strong institutions)

It is well known that strong institutions- transparent and efficient- are imperative for ensuring the inclusiveness of development. The next graph illustrates Egypt's performance in governance arrangements' related indicators according to WB data.

Chart (2): Governance Indicators performance in Egypt (Percentile Rank)



Source: researchers based on (World Bank, 2022).

Egypt has achieved progress regarding Political Stability & Absence of Violence/Terrorism, Rule of Law, and Regulatory Quality in 2021. Specifically, Egypt achieve a remarkable improvement in Regulatory Quality, jumping about 10 ranks, compared to 2015. Additionally, similar progress has been found regarding Rule of Law, and Political Stability and absence of violence and terrorism, which reached 54.2 and 14.6 percentile rank, respectively.

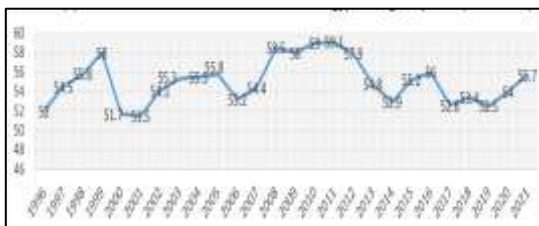
On the contrary, Egypt's performance has witnessed deterioration regarding Control of Corruption although the improvement achieved in 2017. A slight improve has been noticed in 2021.

Similarly, Government Effectiveness has retreated by about 6 percentile rank from its rank in 2019 (World Bank, 2022). The main findings to be drawn here is that Egypt government should pay more attention regarding the weak performance of the mentioned three indicators and to maintain the improvements of the other three in order to pave the way towards the achievement of the SD. According to this, the research addresses the relationship between governance and SD performance throughout the research period.

Economic freedom

EF Index explains the positive relationship between EF and a variety of positive social and economic aspects. Therefore, the ideals of the index imply healthier societies, cleaner environments, greater per capita wealth, human development, democracy, and poverty elimination. Furthermore, the index is measured based on 12 quantitative and qualitative factors, with equal weight being given to each, which is graded on a scale of 0 to 100.

Chart (3): Evolution of Economic Freedom Index in Egypt (1996-2021)



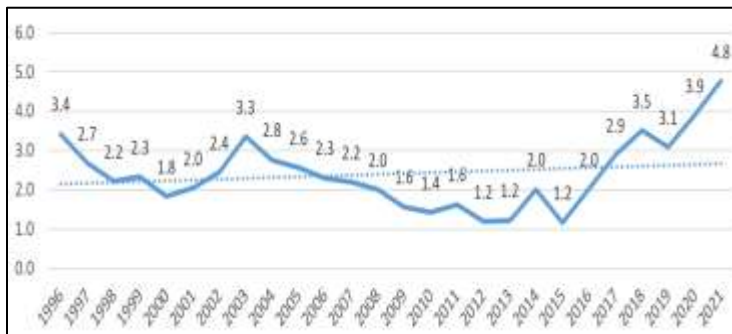
Data indicates that Egypt's score on the EF index moderately increased by about 3.7 points between 1996 and 2021. Despite the modest improvement, the score achieved in 2021 is still less than the highest level achieved across the total period by about 59.1 points in 2011. (Next Chart)

Source: authors, <https://publicknoema.com/>

Furthermore, The Heritage Foundation data³ indicates that Egypt's EF status is repressed, scoring 49.6, and occupying the economy the 151st⁴ freest in the 2023 Index. According to this, Egypt ranked 11th out of 14 countries in the Middle East and North Africa region. Importantly, the overall score is below the regional and world averages (Heritage Foundation, 2023).

Egypt's external debt

Chart (4): Total debt service (% of GNI) in Egypt during the period (1996-2021)



Source: authors, (World Bank, WDI, 2023)

Given the fact that rising external debt burdens absorb a growing share of countries' resources. It is seen crucially to investigate its impact on the SD, considering it one of the main determinant in Egypt since debt stock has significantly surged between 1996 and 2021, recording about USD143.2 bn. in the last year, an increase of 354.6 % compared to 1996 (World Bank, WDI, 2023).

Egypt's external debt stock has significantly surged between 1996 and 2021, recording about USD143.2 bn. in the last year, an increase of 354.6 % compared to 1996 (World Bank, WDI, 2023). The above figure illustrates that the total debt service (% of GNI) in Egypt has increased by about 1.4 % between 1996 and 2021. This ratio takes a general upward trend throughout the total period (1996-2021), revolving around 2.4 %.

Method

In order to test the study's hypothesis and answer the previously mentioned questions, the ARDL will be employed. In contrast to previous co-integration models, such as Johansen and Engle-Granger, ARDL tests the relationship between time series of different orders [0 or/and 1]. The model could further interpret the long and short-run relationships, yielding precise results, particularly with short time series (Pesaran et al, 2001; Hasan & Showman, 2013). Since the ARDL technique shifts from a general to a specific approach, it can tackle several econometric problems that could not be avoided using the traditional co-integration approach (i.e. serial correlation and endogeneity) (Ghouse et al., 2018). According to (Engle & Granger, 1987; Charemza & Deadman, 2002), the existence of an error correction mechanism (ECM) requires the time series to be co-integrated. The research proposes the following estimation model:

$$\Delta sd_t = \alpha_0 + \alpha_1 sd_{t-1} + \alpha_2 govind_{t-1} + \alpha_3 ef_{t-1} + \alpha_4 exs_{t-1} + \sum_{j=1}^p \gamma_1 \Delta sd_{t-j} + \sum_{j=1}^{k_1} \gamma_2 \Delta govind_{t-j} + \sum_{j=1}^{k_2} \gamma_3 \Delta ef_{t-j} + \sum_{j=1}^{k_3} \gamma_4 \Delta exs_{t-j} + \varepsilon_t \quad (1)$$

This is where the dependent variable (SD) denotes sustainable development proxied by ANS (% of GNI). The explanatory variables expected to have an influence on SD in Egypt for the period (1996-2021) are selected in light of the availability of data to bridge the existing gap in the literature. (govind) denotes governance indicator, percentile rank, as an average of the sub-indicators. (ef) denotes EF (the values varies from 0-100,

³ https://www.heritage.org/index/pdf/2023/countries/2023_IndexofEconomicFreedom-Egypt.pdf

⁴ Out of 176 Countries in EF Index 2023. This rank could be attributed to the Weak and low performance of some sub-indexes (such as: Fiscal Health "4.1", Judicial Effectiveness "22.1", Government Integrity "27.9", Labour Freedom "33.4", and Property Rights "39.7"). (Heritage Foundation, 2023).

whereas 0 denotes the worst value and 100 refers to the best rank). (exs), denotes the total debt service (% of GNI). p indicates the number of lagged periods for the regressand. (k_1-k_3) denote the number of lagged periods for the regressors. α_s , γ_s denote the long-run and short-run coefficients, respectively.

The data for sustainable development and total debt service obtained from World Bank, World Development Indicators (WDI). Governance data calculated based on the World Bank, worldwide governance indicators dataset. EF data obtained from Heritage Foundation dataset.

Preliminary steps

Table (2): Descriptive statistics

	Mean	Median	Max.	Min.	Std.Dev.	Skew.	Kurtosis	Jarque-Bera	Prob.
SD	6.0753	6.5787	11.6801	0.8879	2.7236	0.0600	2.2416	0.6387	0.7266
govind	32.3261	34.0336	41.3295	22.9636	6.2601	0.0812	1.5718	2.2382	0.3265

The opposite table shows that the probability values of Jarque-Bera statistic for all variables are more than the 5% significance level, supporting the statistically use of the data.

Source: Eviews 12 Output

Table (3): The results of ADF test

Variables	I (0)		I (1)		Sign. level
	Calculated values of ADF test	P-value	Calculated values of ADF test	P-value	
sd	-1.8182	0.4588	-7.3783	0.0000	1%
govind	-1.0406	0.7223	-4.8210	0.0013	1%
ef	-2.9606	0.0527	-4.8762	0.0007	1%
exs	-0.7051	0.8278	-4.5665	0.0017	1%

The augmented dickey-fuller (ADF) has been employed test to verify that all variables are integrated of order [I(0) or I(1) or I(0 and 1)]. The time series for the variables sd, govind, ef, and exs are not stationary, as their critical values are greater than the absolute values of the calculated ADF test values. As a result, we cannot reject the null hypothesis of the existence of a unit root.

(Source: Eviews 12 Output)

However, after taking the first difference, these time series became stationary or integrated of the first order I(1), where the critical values at the 1% significance levels are less than the absolute values of the calculated ADF test values. Consequently, we can reject the null hypothesis at the first difference and therefore run the ARDL model to test the long-run relationship between the variables.

Testing the long-run relationship using the ARDL

Table (4): Determining the optimal lag length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-204.2030	NA	402.9992	17.3502	17.5465	17.4023
1	-147.2109	90.2375*	13.5649*	13.9342*	14.9159*	14.1946*
2	-135.7293	14.3518	22.4906	14.3107	16.0778	14.7795

(Source: Eviews 12 Output)

In this section, the study employs the Co-integration approach "ARDL & ECM" to analyse the SD function. The paper can do so using the following three steps.

The first step considers the determination of the optimal lag length. As shown in the Table, the optimal lag is one period.

The second step aims at using the bounds test to verify whether the long-run relationship between variables exists or not. Pesaran Et al., (2001), identified three distinct cases by comparing the calculated value of the F-statistic with the critical upper and lower bounds at the 5% significance level. (a) If the calculated value of the F-statistic is higher than the critical upper bound, we can reject the null hypothesis of no long-run relationship. (b) If the calculated value of the F-statistic is less than the critical lower bound, we cannot reject the null hypothesis. (3) If the calculated value of the F-statistic falls between the critical lower and upper bounds, we cannot reject or accept the null hypothesis. As stated in table (5), F-tests seem robust since the calculated value of the F-statistic is 9.76 and exceeds the critical upper bound at significance levels. Consequently, we can reject the null hypothesis ($H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$) of no long-run relationship and alternatively accept the alternative hypothesis of the existence of a long-run relationship ($H_1: \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$).

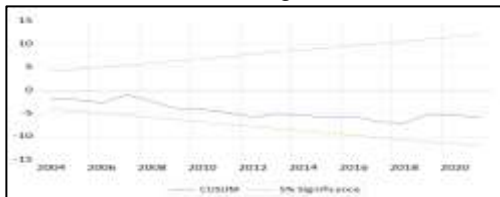
Table (5): Bounds test results

The F statistic value	Critical bounds values (restricted constant & no trend)		
	Significance	I(0)	I(1)
9.76	1%	4.61	5.96
	5%	3.27	4.3
	10%	3.58	2.52

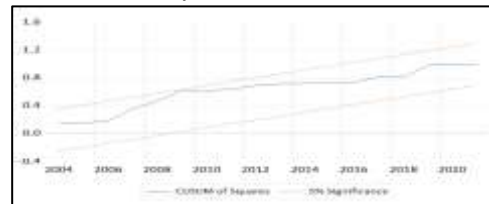
(Source: Eviews 12 Output)- since the sample is less than 30, the critical values developed by Pesaran et al (2001) are unlikely to be valid for the sample size. So, the study uses the critical values introduced by Narayan (2005) for small samples. These critical values are for upper and lower bounds at 30 observations.

The third step seeks to test the model stability over the sample period. In order to do so, the paper uses the two tests “CUSUM & CUSUM of Squares” suggested by Pesaran and Shin (1999) (Institute of National Planning, 2018). The figures (1) show that the cumulative sum and the cumulative of squares values remained between the critical bounds at the significance level of 5%. This result suggests that the models’ estimated coefficients are stable over time, and the residual variance is as well.

Figure 1: Plots of CUSUM & CUSUM of squares



(Source: Eviews 12 Output)



(Source: Eviews 12 Output)

Long-run estimation results

Table (6) referred that Adjusted R^2 is 0.81, revealing that the model explains 81% variation in SD in Egypt. Besides, the probability of the F-statistic is 0.000001, supporting the statistical significance of the ARDL results.

Table (6): Long-run estimations

VARIABLE	Coefficient	Std. Error	t-Statistic	Prob.
SD(-1)	0.0757	0.1735	0.4362	0.6678

GOVIND	0.0450	0.1112	0.4046	0.6905
GOVIND (-1)	0.3009	0.1103	2.7264	0.0139
EF	0.0384	0.1309	0.2932	0.7727
EF(-1)	-0.5515	0.1374	-4.0138	0.0008
EXS	-0.5419	0.3346	-1.6197	0.1227
C	23.8616	8.3895	2.8442	0.0108
R ²	0.8645	Mean dependent var		6.0490
Adjusted R ²	0.8193	S. D. dependent var		2.7764
S. E. of regression	1.1801	Akaike info criterion		3.4006
Sum squared resid	25.0681	Schwarz criterion		3.7418
Log likelihood	-35.5075	Hannan-Quinn criter.		3.4952
F-statistic	19.1411	Durbin-Watson stat		2.0467
Prob (F-statistic)	0.000001			

(Source: Eviews 12 Output)

Table (7): Long-run estimations

Variables	Coefficient	Standard Error	t-statistic	p-value
govind	0.3742	0.0432	8.6584	0.0000
ef	-0.5551	0.1945	-2.8530	0.0106
exs	-0.5863	0.3934	-1.4903	0.1534

(Source: Eviews 12 Output)

As shown in the table, govind and ef are statistically significant. While the coefficients of govind is positive, implying that the SD in Egypt is positively affected by governance (govind).

The coefficient of ef is negative, indicating that the economic reform have a negative impact on the SD in Egypt.

Short-run estimation results

Considering testing the short-run relationship between the governance, economic freedom, external debt, and sustainable development in Egypt for the period (1996-2021), the paper used the Error Correction Model (ECM). As stated in Table (8), the error correction term (ECT) is significant with a coefficient of -0.92 which implies that 92% of the imbalances of sustainable development in Egypt in one year will be adjusted in the next year. Furthermore, the results show that adjusted R² is 0.73, indicating that the model explains 73% variation in sustainable development in Egypt in the short-run.

Table (8): Short-run results

VARIABLE	Coefficient	Std. Error	t-Statistic	Prob.
D(GOVIND)	0.0450	0.0914	1.1509	0.6287
D(EF)	0.0384	0.0983	0.3905	0.7007
ECT(-1)	-0.9242	0.1196	-7.7234	0.0000
R ²	0.7350	Mean dependent var		-0.1703
Adjusted R ²	0.7109	S. D. dependent var		1.9853
S. E. of regression	1.0674	Akaike info criterion		3.0806
Sum squared resid	25.0681	Schwarz criterion		3.2268
Log likelihood	-35.5075	Hannan-Quinn criter.		3.1211
Durbin-Watson stat	2.0467			

(Source: Eviews 12 Output)

Assessing model quality and stability

Table (9): Testing serial correlation & heteroskedasticity

Breusch - Godfrey (LM Test)	F statistic	0.1368	Prob.	0.7160
	Obs* R ²	0.1996	Prob.	0.6550
Breusch-Pagan-Godfrey	F statistic	0.7023	Prob.	0.6516
	Obs* R ²	4.7425	Prob.	0.5772

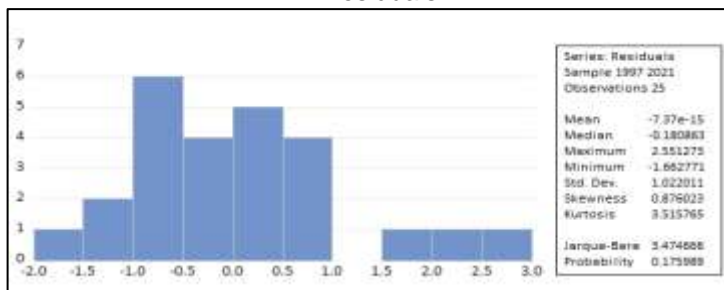
(Source: Eviews 12 Output)

the table indicates that F-statistic's probability value of the Breusch- Godfrey (LM) test is insignificant at all levels of significance.

Hence, we cannot reject the null hypothesis of no serial correlation between the estimated models' residuals. Besides that, the F-statistic's probability of the Breusch–Pagan–Godfrey test for heteroscedasticity is insignificant at all levels of significance.

As a result, we cannot reject the null hypothesis of homoscedasticity of the estimated model residuals.

Figure 2: Jarque-Bera test for normal distribution of the residuals



(Source: Eviews 12 Output)

According to Figure (2), the Jarque–Bera statistic is 3.4746 with a probability of 0.1759, indicating the insignificance at the 1%, 5%, and 10% significance levels, supporting the acceptance of the null hypothesis. Thus, the residuals are normally distributed

Conclusion and policy implication

This work addressed the literature gap by testing the long-run and short-run relationships between SD as a dependent variable and some explanatory variables that are expected to have an impact on achieving SD in Egypt according to the literature reviewed, which are Governance, Economic Freedom, and External Debt, during the period (1996-2021). The long-run results showed that Governance positively affects SD. SD, on the contrary, has been negatively affected by Economic Freedom. In this context, promoting all the governance arrangements/dimensions will positively influence SD achievement in Egypt. In addition, enhancing EF in Egypt such as fiscal health, judicial effectiveness, Government integrity, labour freedom, and property rights is a milestone in promoting the business climate and achieving the SD.

Building on this, enhancing the imperative role of governance and EF, with decreasing the rely on external debt in financing SD, will help government in boosting the sustainability requirements as well as implement the second phase of the reforms known as “the structural reforms” aimed at supporting certain sectors and increasing the competitiveness of the Egyptian economy.

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