



THE IMPACT OF CORRUPTION ON HUMAN DEVELOPMENT IN EGYPT



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ABSTRACT

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The objective of this study is to investigate the impact of corruption on human development in Egypt, both in the short and long run, for the period from 1995 to 2018 using the Autoregressive Distributed Lag Model (ARDL). There is a broad amount of the literature that examines the effects of corruption on economic development, but less of the literature, especially empirical, focuses on corruption's effect on human development. Some studies investigate its influences on poverty, others examine those influences on education and/or health but this study assesses its impact on human development expressed by the Human Development Index with its three dimensions. This study contributes to the literature on investigating the determining factors of human development by adding corruption as one of the institutional variables influencing human development besides economic factors. The empirical analysis shows that corruption has a negative and significant effect on human development in both the short and long run, meaning that increased corruption weakens human development. As for GDP per capita, it has a significant and positive effect on human development in both the short and long run. While the government expenditure's effect is insignificant in the short run, it becomes significantly positive in the long run. With regard to urbanization, it affects human development negatively in the short run, and its effect becomes positive -but insignificant- in the long run. The study concludes that policymakers can combat corruption by focusing on causes not on effects.

Contribution/ Originality: This study contributes to the existing empirical literature which investigates the effects of corruption, by focusing on corruption's impact on human development (HDI with its three dimensions) in Egypt. It also contributes to the literature by adding corruption as one of the institutional variables influencing human development besides economic factors.

1. INTRODUCTION

Corruption is still a critical problem all over the world. It has reached high levels in many countries, and is considered one of the main causes that impede the development process. Defined as the abuse of public office for private benefit, corruption has severe adverse effects on the economic growth and development of any country, as it reduces incomes, hinders domestic and foreign investments, increases inflation, encourages rent-seeking activities, misallocates resources and distorts markets, decreases tax revenues, raises income inequality and poverty, increases child and infant mortality rates and worsens education quality (Akçay, 2006; Iskandar & Saragih, 2018; Murshed & Mredula, 2018; Ortega, Casquero, & Sanjuán, 2014).

In light of these adverse effects of corruption, and in order to fight corruption to guarantee the sustainability of human development worldwide by 2030 and beyond, the Sustainable Development Agenda approved in 2015 by the United Nations, which includes seventeen goals, underlines in goal 16 some points that address the corruption issue (target 16.5: Substantially reduce corruption and bribery in all their forms)¹ (Mackey, Vian, & Kohler, 2018; Palash, 2018; United Nations, 2019).

The objective of this study is to investigate the impact of corruption on human development in Egypt, both in the short and long run, for the period from 1995 to 2018 using the Autoregressive Distributed Lag Model (ARDL) developed by Pesaran and Shin (1995) and Pesaran, Shin, and Smith (2001). The study addresses this question: does corruption impede the attainment of a high level of human development in Egypt?

There is a broad theoretical and empirical literature that examines the causes of corruption and its effects on economic development and other macroeconomic variables (Murshed & Mredula, 2018; Ortega et al., 2014). A smaller portion of the literature, especially empirical, focuses on corruption's effect on human development. Some studies investigate its influences on poverty, others examine those influences on education or health indicators or both. This study attempts to assess the impact of corruption on human development in Egypt expressed by the Human Development Index (HDI) with its three dimensions (income, knowledge, and health) (Akçay, 2006). This study tries to contribute to the literature on investigating the determining factors of human development by adding corruption as one of the institutional variables influencing human development besides economic factors (Amate-Fortes, Guarnido-Rueda, & Molina-Morales, 2015). In addition, the results of this study will be useful in assessing the extent to which higher corruption weakens human development in Egypt, and will increase the awareness of policy makers and individuals of the negative effects of corruption on human development, hence encouraging individuals to participate in combating corruption (Iskandar & Saragih, 2018).

This study is arranged as follows: section 2 reviews the literature on the impact of corruption on human development; section 3 addresses corruption in Egypt and its relative position with other countries; section 4 describes the database used and the ARDL model applied to estimate the short and long run impacts of corruption on HDI; section 5 shows the empirical results; and finally, section 6 presents conclusions and policy implications.

2. LITERATURE REVIEW

Corruption is considered a main challenge to achieving economic and human development, and this is supported by theoretical and empirical evidence (Palash, 2018). In general, corruption may be defined as the abuse of public office for private benefit (World Bank, 1997) such as when officials accept or ask for a bribe, and also when private entities provide kickbacks to avoid policies or procedures in order to make more profit and to be more competitive. In addition, patronage and preferential treatment, stealing public assets and the misallocation of public revenues are other forms of abusing public office (Akçay, 2006).

Corruption may be categorized as follows: grand corruption, petty corruption and political corruption. Grand corruption refers to actions that enable leaders to achieve gains at the cost of the public good and is performed at high levels of government through distorting policies or the state central functioning. Petty corruption shows how low-level and mid-level public officials misuse their power when dealing with citizens who need to access essential goods and services in places as schools, hospitals, police departments and other agencies. Political corruption occurs when decision makers abuse their position to maintain status, power and wealth, or manipulate policies and rules influencing resource allocation and financing (Transparency International, 2018).

Corruption has a negative impact on economic growth and human and sustainable development (Palash, 2018). This study investigates whether corruption affects human development, and how. The literature review showed

¹ The targets of goal 16 address the proportions of persons who paid or were asked to pay bribes to public officials, and the proportions of businesses who paid or were asked to pay bribes to public officials (United Nations, 2019).

that corruption can influence human development indirectly by affecting economic growth (Akçay, 2006) and directly by influencing its dimensions: poverty, education and health.

While some scholars argue that corruption can motivate economic growth and development under certain conditions, noting that corruption can grease the wheels of economic growth and development, greater evidence supports the contrary view: corruption is sanding the wheels of growth, that is, corruption adversely affects economic growth and development (Akhter, 2004; Campos, Dimova, & Saleh, 2010).

Few studies argue that corruption is not detrimental for growth (Palash, 2018): their view is that corruption facilitates trade and can enhance economic growth by stimulating entrepreneurship and efficiency and through helping the private sector to avoid the highly restraining regulatory environment (Campos et al., 2010; Leff, 1964). Leff (1964) proposed that benefits from corruption obviously offset its costs. The "consequentialist" approach suggests that if the consequences of bribery are better than those of any other alternative, then bribery is ethically right (Qizilbash, 2001). The literature also supports the "Asian paradox" which shows that corruption and growth are positively correlated in some booming Asian economies, together with China (Campos et al., 2010).

Opposing this view, there is a large amount of literature in favor of the hypothesis that corruption sands the wheels of growth, which means that corruption has a negative impact on economic growth and development (Palash, 2018) and that high corruption increases poverty and income inequality (Akçay, 2006). Various studies, especially on developing countries, as most are assumed to suffer from high corruption and political instability, argue that corruption decreases economic growth through reducing private investment (Campos et al., 2010), influencing government spending by cutting the amount dedicated to education (Mauro, 1997), reducing the effectiveness of expenditure on public investments, limiting the progress of small-and medium-sized enterprises and delaying innovation (Amate-Fortes et al., 2015). Aidt (2010) reassured these results, using panel data of 110 countries, most of them developing, from 1996 to 2007, and showed that corruption decreases sustainable development (Aidt, 2010).

These studies reported the same opinion of key international actors like the World Bank, the International Monetary Fund, the Organization of Economic Cooperation and Development and anti-corruption agencies at both national and international levels (Campos et al., 2010).

But this empirical evidence regarding the impacts of corruption on economic growth and development has not been conclusive yet. Campos et al. (2010) referred to 41 different studies regarding the impact of corruption on growth and showed that, from 460 empirical estimates in these studies, about 32 percent illustrated a negative and significant effect of corruption on growth, 62 percent implied an insignificant relationship, and about 6 percent only illustrated a positive significant relationship. This may support the sanding hypothesis more than the greasing one (Campos et al., 2010).

Qizilbash (2001) referred to the opinion of Amartya Sen who considered development as capability expansion, and who supposed that corruption is not good for development, since he has regarded corruption as one of the main obstacles in the way of successful economic improvement. Qizilbash (2001) mentioned that Sen explained how corruption can have a direct influence on human development: as high corruption may be a cause of public policies ineffectiveness and can move investment and economic activities in the direction of unproductive and dishonest high profit activities. Therefore corruption can weaken the impact of public policies that target satisfaction of essential needs or capabilities (Qizilbash, 2001).

In addition, since the concept of human development implies realizing equity, it involves improving the quality of life for all, so there is more reason to think that corruption will deteriorate human development (Qizilbash, 2001). If equity includes also inter-generational equity, and corruption can weaken environmental policies which benefit future generations, then it undermines equity for these generations.

In its Human Development Reports, which have supported Sen's capability vision of development, the United Nations Development Program (UNDP) shows that corruption is bad for human development and concentrates on

its consequences. The UNDP (1997) explained that corruption may involve embezzlement of budgets dedicated for education or health care. Also, if civil servants or politicians drain foreign aid intended to help in alleviating poverty, then corruption obviously weakens human development (Qizilbash, 2001; UNDP, 1997).

Therefore, corruption has some direct and indirect negative impacts on human development. Firstly, corruption can affect human development by decreasing economic growth, and secondly, it shifts away government investment from basic sectors like health and education to some other unproductive sectors. Generally, corruption tends to lower human development which is shown by several studies (Akçay, 2006; Mauro, 1997). In addition, Mo (2001) found a negative relation between education and widespread corruption (Mo, 2001; Palash, 2018).

Becherair and Tahtane (2017) confirmed these results using Pearson correlation, causality testing and panel data on a sample of 17 Middle Eastern and North African countries (Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Qatar, Saudi Arabia, Syria, Sudan, Tunisia, United Arab Emirates and Yemen) during the period 1996-2012. Their study found a negative impact of corruption on human development (Becherair & Tahtane, 2017). Akçay (2006) also found a significant negative relationship between three different corruption indexes and human development in a sample of 63 countries. He showed that countries with higher corruption levels have a propensity to lower human development (Akçay, 2006).

Absalyamova, Absalyamov, Khusnullova, and Mukhametgalieva (2016) investigated the impact of corruption on human capital sustainable development index² (HCSDI) in Russia. The results revealed that any addition in the level of corruption by 1% decreases HCSDI by more than 1%. Therefore, when corruption level declines, the quality of human capital will be much better, the income inequality will be lower and economic growth will go faster (Absalyamova et al., 2016).

As for Akhter (2004), he showed the role of corruption as a transmission channel; he found that economic globalization affects human development positively through decreasing corruption, because multinationals do not operate in countries with higher corruption at the same level that they operate in countries with lower corruption (Akhter, 2004).

Briefly, there is a number of negative effects of corruption and, in all its features, corruption hinders human development (Akçay, 2006). Corruption affects human development also through influencing its dimensions: through its impact on poverty, education and health; and this is done by hampering growth and decreasing social spending in fields like education and health (Akçay, 2006).

Wong and Gomes (2014) concluded that, in Africa and any other place in the world, there is a correlation between low Human Development Index and high corruption levels, and that poverty - represented by shortage of food, shelter, education and health care - seems to be the essential reason for this relationship occurring (Wong & Gomes, 2014).

The channels through which corruption can negatively affect poor people are numerous, given that private entities and government officials can increase their wealth through corruption, as they get a bigger share from public benefits which, increases income inequality. Corruption also distorts resource allocation because corruption shifts public resources from infrastructure investments benefiting poor people, like schools and hospitals, to spending on capital intensive investments, since spending on equipment purchases gives more opportunities for bribes (Iskandar & Saragih, 2018).

Corruption also affects the quantity and quality of education and health services that are essential to human capital formation. Iskandar and Saragih (2018) concluded that higher corruption tends to be associated with lower levels of social spending. This means that when corruption increases, the total government spending on education

² This study calculated (HCSDI) as follows: $HCSDI = HDI / \sigma / \max \{ HDI / \sigma \}$

where HDI is the human development index, σ is the standard deviation of the private indicators contained in the calculation of HDI using their average value; $\max \{ HDI / \sigma \}$ presents the maximum value of the test indicator of the population.

and health will decrease (Iskandar & Saragih, 2018). This is because corruption reduces the resources available for the provision of social services, including education. Also the higher the level of corruption, the lower the tax revenue, since corruption can lead to inappropriate tax exemptions and to tax evasion and deteriorates tax administration (Akçay, 2006; Iskandar & Saragih, 2018).

In addition, corruption causes regular government spending, like wages, to be more than spending dedicated to operations and maintenance. Corruption influences governments' capability of enhancing educational attainment level (Gupta, Davoodi, & Alonso-Terme, 1998) because corruption may increase the cost of education services which leads to lower enrollment rates. This happens, for example, when schools or teachers take bribes to supply books financed by the government, or to allow school admission or passing exams (Gupta, Davoodi, & Tiongson, 2000). This view was supported by Gupta et al. (2000) given that its empirical investigation illustrated that dropout rates in primary school increase because of corruption (Akçay, 2006).

Ille and Peacey (2019) referred to Duerrenberger and Warning's study which showed that corruption has a negative impact on the expected years of schooling and that low-corruption countries have a positive public higher education enrollment while high-corruption countries have a negative one (Ille & Peacey, 2019). Corruption may also lower the quality of education services if there are payoffs or bribes when employing and promoting teachers (Gupta et al., 2000).

Corruption may also be one of the causes of brain drain, as Cooray and Schneider (2016) indicated that the emigration rate of individuals who reach high levels of educational attainment increases with higher corruption levels. The empirical findings showed that when corruption increases, the emigration rate³ of highly-skilled persons increases as well (Cooray & Schneider, 2016).

As for health services, Gupta et al. (2000) showed that corruption can increase the cost of health care (Gupta et al., 2000). Many studies explained the effect of corruption on health outcomes, Ortega et al. (2014) estimations showed that the negative effect of corruption on human development growth appears to be limited to the health component of the Human Development Index from all its three components (Ortega et al., 2014). Siverson and Johnson (2014) concluded also that corruption can be harmful to health outcomes (Siverson & Johnson, 2014) and that this may be shown from its effect on health care indicators (Gupta et al., 2000). Gupta et al. (2000) found that corruption increases infant and child mortality rates and the percentage of low-birth-weight babies in total births. The results of Kaufmann, Kraay, and Zoido-Lobaton (1999) also showed that corruption raises infant mortality rates and reduces life expectancy (Akçay, 2006; Kaufmann et al., 1999).

In addition, corruption may worsen the quality of health care, because patients suffer from insufficient treatment and lack of medicines, and in order to get bribes, access to health services may be restricted or postponed (Gupta et al., 2000).

All the above studies advocate the view that corruption is detrimental to human development, since it affects poor people negatively, and weakens the quantity and quality of social services (education and health).

3. CORRUPTION IN EGYPT

Since the 2011 revolution, the Egyptian economy has been suffering from many weaknesses in different sectors. Corruption levels have increased and corruption continues to be a major problem. This encouraged the informal economy which is estimated to be about 70 percent of Egypt's economy. This stimulated corruption because people working in the informal economy may give bribes rather than taxation to get some essential services (Transparency International, 2015).

Several types of corruption: grand, petty, political and administrative, can be found in Egypt. Petty corruption, meaning ordinary citizens paying bribes, is quite widespread in Egypt. According to public opinion surveys, health

³ Rates of emigration from different countries of origin to twenty of the Organization for Economic Cooperation and Development countries.

services are the public services most prone to corruption. Petty corruption in Egypt is a way to get things done not to take anything extra. This may mean that Egypt suffers from what scholars call “need corruption”. The widespread corruption when people deal with government offices is possibly due to the high level of centralization, local governors' discretionary authority and lack of control at the same time. As for grand corruption, it can be observed when people need to get permits particularly for construction and in relation to infrastructure (Transparency International, 2015).

In addition, nepotism is a very regular characteristic of the Egyptian economy, as people can be employed through personal relations and arrangements. Therefore, this prevents trained, efficient and innovative people from occupying certain positions, and increases unemployment, which discourages human development and has a negative effect on the economy (Transparency International, 2015).

The extent of corruption and its evolution over time in Egypt is illustrated by following the trend of Corruption Perceptions Index (CPI) introduced by Transparency International. Like previous years, Egypt performed quite poorly in (CPI) in 2018, being ranked 105 out of the 180 countries assessed (Transparency International, 2019).

The CPI is expressed as a value scaled from 0 to 10⁴, with 0 representing highest corruption and 10 lowest corruption. Nevertheless, in order to facilitate interpretation, this index is rescaled in this paper such that the score is subtracted from 10 to indicate higher corruption for higher scores. Figure 1 below shows the trend of corruption in Egypt in the period (1998-2018).

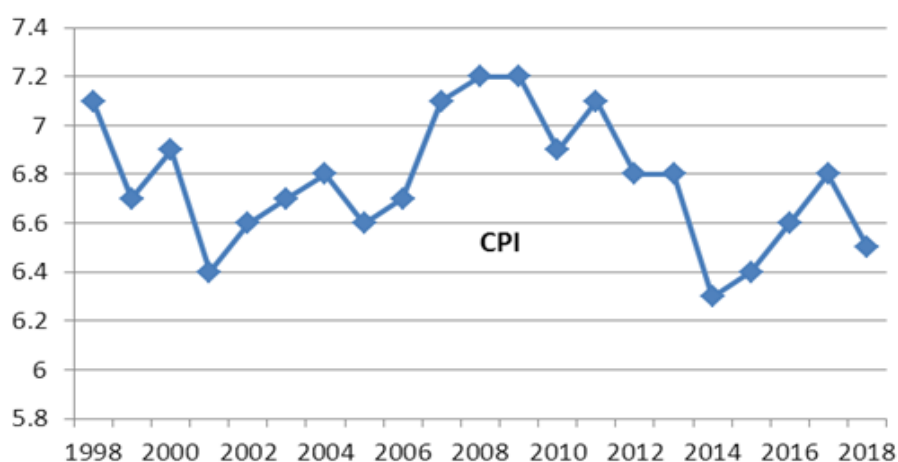


Figure-1. Trend of Corruption (10-CPI) in Egypt (1998-2018).

Source: Transparency International (2018).

As for Egypt's position compared with other countries, for example MENA countries, the graph below illustrates that Egypt's rank is still far from the United Arab Emirates (UAE) and Qatar, which have the lowest corruption rates in the region, but much better than Syria and Yemen, which have the highest corruption rates in the region. Syria and Yemen are also ranked within the five most corrupt countries in the one hundred and eighty countries assessed by the CPI.

At the same time, considering the HDI of these countries, the graph shows that Egypt's HDI (0.696) is still much lower than the UAE (0.863) and Qatar (0.856), which have the lowest corruption rates in the MENA region, and much better than Syria (0.536) and Yemen (0.452), which have the highest corruption rates in the region.

* In 2012, the Corruption Perception Index scored countries on a scale of 0 to 100 instead of a scale of 0 to 10 (Iskandar & Saragih, 2018).

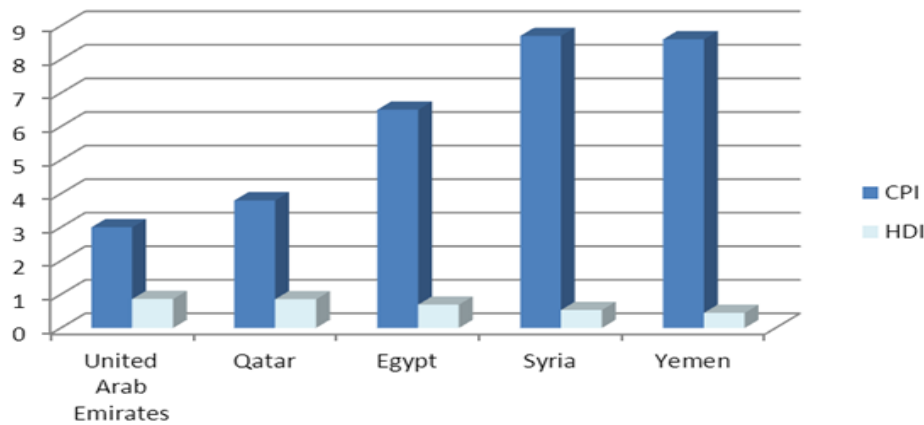


Figure-2. CPI and HDI: Egypt and Selected MENA Countries.
Source: Transparency International (2019) and Human Development Reports data.

Corruption affects human development in Egypt, this may be seen through different aspects especially in the education and health sectors. Poor physical infrastructure of schools and hospitals affects the quality of education, safety of students and health services. This poor quality of infrastructure is the outcome of corruption (Palash, 2018).

It is extremely important to fight all forms of corruption in the education sector, since enhancing education means giving more opportunities and higher earnings for individuals, and increasing macroeconomic growth as well (Ille & Peacey, 2019). In Egypt, the reduction in public sector real wages since the 1980s has been encouraging corruption to prevail in the public sector. Teachers have been trying to increase their earnings through giving classes after school and private tutoring centers started to operate in Egypt. The problem is not that teachers are trying to raise their income, but that forcing students to take private lessons, by punishing them or by intentionally reducing the effort made in class and focusing on the private tutoring hours, represents a form of corruption (Ille & Peacey, 2019; Ille., 2015).

This idea was emphasized by the information reported by Transparency International (2013) about corruption at the classroom level in Eastern and Southern Europe, Sub-Saharan Africa and the Middle East, including Egypt. It showed that teachers can oblige students to take redundant private tutoring, or they may be absent in order to perform similar job (Ille & Peacey, 2019; Transparency International, 2013). In addition, many parents in Egypt stated that paying for private lessons impedes inclusive access to educational services (Ille & Peacey, 2019; The Organization for Economic Cooperation and Development (OECD), 2015).

Egyptians' brain drain, that is a great number of graduates and post graduates educated in Egypt migrate giving their experiences and efforts to develop other countries, is also one of the outcomes of corruption in Egypt (Abdelbaki, 2017).

With regard to health in Egypt, the private sector is providing services that are more expensive than the public sector but with higher quality. In addition, since income in the private health sector is much higher than the public sector, skilled health staff leave the latter to work in the former. Corruption is encouraged as health providers asks patients to go to their private clinics instead of treating them at the public hospitals or clinics (Abdel Latif, 2013).

Corruption is also seen through managers treating staff differently, for example, in working hours, or taking trainings and allowing absence. Corruption is observed in misusing the budgets allocated for buying equipment or maintenance or doctors incentives. Therefore, this sort of corruption may lead to a shortage in equipment or basic tools, etc.. Doctors and nurses may feel that they are treated unfairly because of the discrimination against them, which may be reflected on their attitude with patients. All this produces poorer quality of health services (Abdel Latif, 2013).

4. RESEARCH METHODOLOGY

In the first section, the reviewed literature demonstrated that corruption may undermine human development through decreasing the potential income and the quantity and quality of health and education. This section investigates empirically the relationship between corruption and human development in Egypt during the period 1995-2018.

4.1. Variables Description and Data Source

- **Human Development** is expressed by the Human Development Index (HDI) which is a composite index used in ranking countries depending on three essential aspects of human development: having a long and healthy life, determined by life expectancy at birth; being able to obtain knowledge, expressed by mean years of schooling and expected years of schooling and being able to realize a decent standard of living, assessed by per capita gross national income. HDI is categorized into: very high HDI, high HDI, medium HDI and low HDI (Becherair & Tahtane, 2017; Shah, 2016).

- **Corruption** is represented by the Corruption Perception Index (CPI) whose data has been developed by Transparency International since 1995. This is done through ranking countries according to how corrupt their public sector is perceived to be, referring to a combination of polls and reflecting visions of witnesses from all over the world, while taking into account the opinion of experts who live and work in the countries assessed (Transparency International, 2018a). The CPI is expressed as a value scaled from 0 to 10, with 0 representing highest corruption and 10 lowest corruption. In order to facilitate interpretation, and following other studies⁵, this index is rescaled in this paper such that the score is subtracted from 10 to indicate higher corruption for higher scores (Akhter, 2004). The literature survey demonstrated that corruption is detrimental for economic growth and development. Therefore, it is expected that the coefficient of the corruption index will have a negative sign (Akçay, 2006).

- **GDP per capita** (GDPCAPI) (constant 2010 US\$) is the gross domestic product divided by midyear population. GDP per capita is expected to be positively related to HDI. As disposable income increases, people will have more resources for better housing, food, and health care (Shah, 2016).

- **Government Expenditure** (GOV) is the general government final consumption expenditure (% of GDP), used as a proxy to social government expenditure. Corruption reduces the quantity and quality of public education and health spending (Gupta et al., 2000).

- **Urban population (% of total)** (URBAN) refers to people living in urban areas as defined by national statistical offices. It is expected that increased urbanization will enhance health conditions and education outcomes (Gupta et al., 2000).

The sources for our data were Human Development Reports (UNDP) for HDI; Transparency International for CPI and the World Development Indicators (WDI) of the World Bank for other variables.

4.2. The Model

To examine the impact of corruption on human development in Egypt, the study applies an Autoregressive Distributed Lag (ARDL) Model. The ARDL approach as developed by Pesaran and Shin (1995) and Pesaran et al. (2001) has recently been the popular method for exploring both the long and short run relationships between variables. ARDL can be applied whether the variables are $I(0)$, $I(1)$ or reciprocally cointegrated⁶. In addition, ARDL

⁵(Akçay, 2006; Akhter, 2004; Iskandar & Saragih, 2018; Ortega et al., 2014).

⁶In order to use the ARDL model, variables should not be integrated of order two $I(2)$, as the test statistics will not be applicable (Kisswani, Kisswani, & Harraf, 2019).

gives strong results even if the sample is small and some of the independent variables are endogenous (Iskandar & Saragih, 2018; Kisswani et al., 2019; Pesaran et al., 2001).

In the empirical analysis, the study uses the following model to understand the impact of corruption and some other potential determinants on human development:

$$HDI_t = \alpha_0 + \alpha_1 CPI_t + \alpha_2 GDPCAPI_t + \alpha_3 GOV_t + \alpha_4 URBAN_t + \varepsilon_t$$

Where HDI is the Human Development Index, CPI is the Corruption Perceptions Index (used as a proxy to capture the effect of corruption), GDP is the Gross Domestic Product per capita (used to denote the standard of living), GOV is the government expenditure (used as a proxy to social expenditure), URBAN is % urban population and ε is the error term.

This is represented by the following ARDL model:

$$\begin{aligned} \Delta HDI_t = & \alpha + \beta_0 HDI_{t-1} + \beta_1 CPI_{t-1} + \beta_2 GDPCAPI_{t-1} + \beta_3 GOV_{t-1} + \beta_4 URBAN_{t-1} \\ & + \sum_{i=1}^m \delta_{1i} \Delta HDI_{t-i} + \sum_{i=0}^n \delta_{2i} \Delta CPI_{t-i} \\ & + \sum_{i=0}^q \delta_{3i} \Delta GDPCAPI_{t-i} + \sum_{i=0}^r \delta_{4i} \Delta GOV_{t-i} + \sum_{i=0}^s \delta_{5i} \Delta URBAN_{t-i} + u_t \end{aligned}$$

Where Δ is the first difference; m, n, q, r and s are the lag length and u is the residual term. And where $-\beta_1/\beta_0$, $-\beta_2/\beta_0$, $-\beta_3/\beta_0$, $-\beta_4/\beta_0$ represent the long run coefficients, and $\delta_1, \delta_2, \delta_3, \delta_4, \delta_5$ represent the short run coefficients (Kisswani et al., 2019).

5. EMPIRICAL RESULTS

The first step uses unit root to test the stationarity of the time series of the variables; and the second step uses the bounds test and the error correction model to check the long run relationship between variables.

5.1. Unit Root Test

The Augmented Dickey-Fuller (ADF) test is used to check whether the variables have a unit root (are not stationary) or do not have a unit root (stationary). The null hypothesis of the test is that the series have a unit root. The results are presented in Table 1 and show that GDPCAPI and URBAN are stationary in the level I(0); while HDI, CPI and GOV are stationary in the first difference I(1) and none of the variables is integrated from order 2 which means I(2). Therefore we can use the ARDL model.

Table-1. Augmented dickey-fuller (ADF) test results.

Variable	(t-Statistic)	Critical Values			Integration
		1%	5%	10%	
HDI	-4.538359**	-4.571559	-3.690814	-3.286909	I(1)
CPI	-5.278438*	-4.571559	-3.690814	-3.286909	I(1)
GDPCAPI	-3.499793***	-4.616209	-3.710482	-3.297799	I(0)
GOV	-2.656156**	-2.699769	-1.961409	-1.606610	I(1)
URBAN	-2.746193***	-3.857386	-3.040391	-2.660551	I(0)

Note: * Stationary at 1% , **Stationary at 5%, ***Stationary at 10%

5.2. ARDL Bounds Test

To investigate the existence of a long-run relationship (cointegration), we continue to use the ARDL bounds test, which is the F-test, with the null hypothesis: there is no long-run relationship among the variables, in

opposition to the alternative hypothesis that there is a long run relationship (Iskandar & Saragih, 2018; Kisswani et al., 2019).

The computed F- statistic is compared with the two critical values of the F-statistic generated by Pesaran et al. (2001) (upper bound I(1), and lower bound I(0)). If the computed F is larger than the upper bound I(1), we reject the null hypothesis therefore, there is a long run relationship (cointegration); but if the F-statistic is less than the lower bound I(0), we cannot reject the null hypothesis, then there is no long run relationship (cointegration) among the variables. Lastly, if the computed F-statistic lies between the two bounds, the result is inconclusive (Iskandar & Saragih, 2018; Kisswani et al., 2019; Türsoy, 2017).

Table 2 shows that the F-statistic is greater than the upper bound critical value I(1) at all significance levels, so we reject the null hypothesis, which means that there is a long-run relationship (cointegration) among human development, corruption, GDP per capita, government expenditure and urbanization.

Table-2. ARDL bounds test results.

F-statistic	Critical Value Bounds (K=4)		
	I(0) Bound	I(1) Bound	Significance
8.379189	2.45	3.52	10%
	2.86	4.01	5%
	3.74	5.06	1%

After estimating our ARDL (1, 2, 2, 2, 1)⁷ model and testing for the existence of a long run relationship, we continue to check the long-run and short-run effects of corruption and other variables. With regard to short-run effects, Table 3 illustrates that the coefficient of corruption has a negative and significant effect on human development as expected. GDP per capita has a significant and positive effect on human development also as expected. However, government expenditure's effect is insignificant, and urbanization affects human development negatively.

Table 3 demonstrates the error correction coefficient CointEq(-1), which determines the speed of adjustment of the variables to the long-run equilibrium. Therefore, this coefficient should be negative and significant; and this is indicated in Table 3 as CointEq(-1) equals -0.502011, which means that 50% of the deviation from equilibrium in the short run will be adjusted annually until reaching the long run equilibrium (Kisswani et al., 2019; Türsoy, 2017).

Table-3. Results of error correction model and short run coefficients.

Variable	Coefficient	t-Statistic	Prob.
D(CPI)	-0.003749	-2.397783	0.0618
D(CPI(-1))	-0.001483	-0.975798	0.3740
D(GDPCAPI)	0.000052	2.858326	0.0355
D(GDPCAPI(-1))	-0.000036	-2.222255	0.0769
D(GOV)	-0.000792	-0.775119	0.4733
D(GOV(-1))	-0.003502	-3.809424	0.0125
D(URBAN)	-0.072190	-3.279829	0.0220
CointEq(-1)	-0.502011	-3.459823	0.0180

Table-4. Long run coefficients.

Variable	Coefficient	t-Statistic	Prob.
CPI	-0.014387	-2.449302	0.0580
GDPCAPI	0.000077	9.193064	0.0003
GOV	0.004997	2.079265	0.0921
URBAN	0.002594	0.197386	0.8513
C	0.406296	0.809884	0.4548

⁷ Numbers between brackets represent lag length for each variable.

As for the long run effects, the results are reported in Table 4 which shows that the effect of corruption remains significant and negative in the long run, as expected, and also its coefficient value (0.014) is greater than the short run (0.003). This negative sign, implies that lower levels of corruption are associated with higher levels of human development. These results agree with the United Nations Human Settlements Program, which says that, in general, higher levels of human development are related with lower levels of corruption (Mendonça & Fonseca, 2012) and the results of this study also support the findings of Amate-Fortes et al. (2015) and Amate-Fortes, Guarnido-Rueda, and Molina-Morales (2017) showing that corruption negatively affects human development.

Many empirical studies illustrated the reasons for this negative sign, as corruption affects the resources allocated to education and health. Mauro (1997) showed that corruption cuts government spending on education and health. Gupta et al. (1998) found that corruption decreases social spending, deteriorates secondary schooling and increases income inequality and education inequality (Akçay, 2006; Becherair & Tahtane, 2017).

GDP per capita still affects human capital positively and significantly in the long run as expected. As for the government expenditure effect that was insignificant in the short run, it became significant and positive in the long run. This is the expected sign and this result supports the findings of Kızılkaya, Koçak, and Sofuoğlu (2015).

Urbanization offers opportunities and poses challenges for human development. It has the potential to augment economic activity, provide employment opportunities and enhance access to basic services, however, it can turn cities into places of deprivation, inequality and exclusion (Ul Haq, 2014). The coefficient of urbanization is negative in the short run, because access to education, better health services and good job opportunities may take time to achieve their desired effect. But in the long run, although insignificant, the urbanization effect becomes positive, which is the expected sign, and is supported by Arouri, Ben, Nguyen-Viet, and Soucat (2014)'s findings, as urbanization improves access to basic education for all, and urban populations have more chances to reach hospitals and care centers (Arouri et al., 2014).

5.3. Diagnostic Tests of the ARDL Model

Finally, to check the robustness of the ARDL model, some diagnostic tests⁸ are conducted and the goodness of fit statistics are checked. Findings are reported in Table 5.

The first diagnostic test examines the serial correlation of the residuals (Lagrange Multiplier (LM)); the null hypothesis of this test - that there is no autocorrelation - cannot be rejected. The second test, the Ramsey's RESET test, examines the model specification (functional form); the null hypothesis of this test - that the model is correctly specified - cannot be rejected.

Table-5. Diagnostic tests results.

Test	Statistics & p-value
R-squared	0.999
Adjusted R-squared	0.998
F-statistic	1377.835 [0.000000]
Serial Correlation LM Test	2.198547 [0.2123]
Ramsey RESET Test	0.001846 [0.9678]
Heteroskedasticity Test	2.766993 [0.1348]
Normality (Jaque- Bera)	0.542547 [0.762408]

Note: Numbers in parentheses represent p-value.

⁸ (Kisswani et al., 2019; Shrestha & Bhatta, 2018; Thi Thao & Jian Hua, 2016; Türsoy, 2017).

The third test is the Heteroscedasticity test, its null hypothesis - that there is no heteroscedasticity - is supported. The fourth test, which examines the error normality distribution, after checking Jarque-Bera statistics (J-B); the null hypothesis of this test - that the errors have a normal distribution - cannot be rejected. At last, in order to verify the stability of the model, the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) are checked. They are illustrated in Figure 3 and Figure 4 which show that the plot of CUSUM and CUSUMSQ lies within the 5% critical bounds. Therefore the ARDL model passes all of the diagnostic tests (null hypotheses cannot be rejected as all p-values are larger than 0.05), and finally adjusted R^2 shows that the model goodness of fit is high.

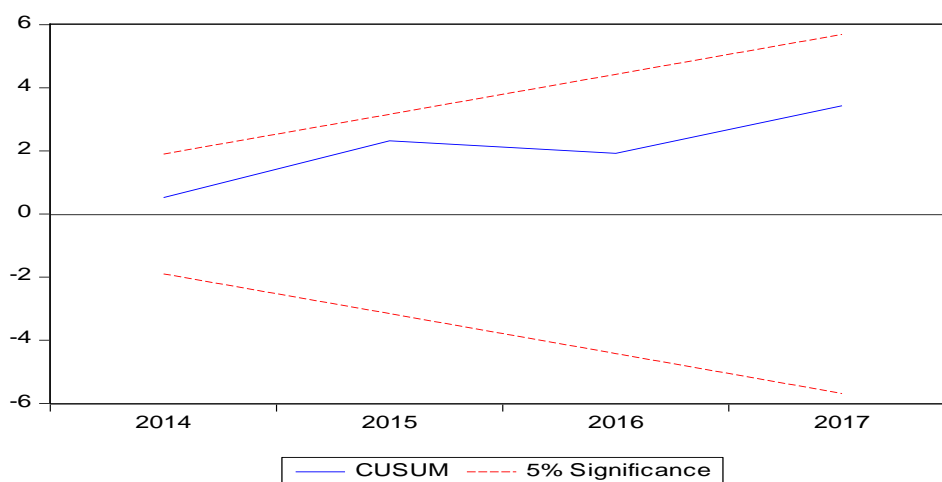


Figure-3. Cumulative Sum (CUSUM).

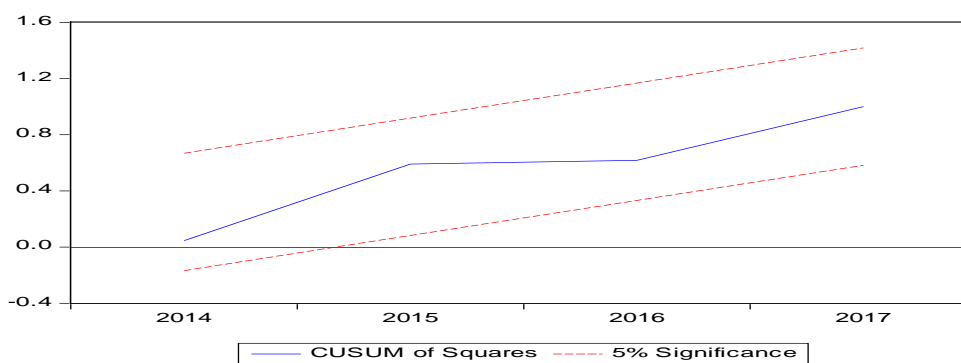


Figure-4. Cumulative Sum of Squares (CUSUMSQ).

6. CONCLUSIONS AND POLICY IMPLICATIONS

Corruption continues to be a crucial problem in Egypt as it performed quite poorly on Transparency International's Corruption Perceptions Index (CPI) in 2018, being ranked 105 out of the 180 countries assessed (Transparency International, 2019). Corruption plays a big role, through its different types, in hampering human development in Egypt.

Therefore, this study examined the impact of corruption on human development in Egypt in the period 1995-2018, using the Autoregressive Distributed Lag Model (ARDL) developed by Pesaran and Shin (1995) and Pesaran et al. (2001). The empirical analysis showed that corruption had a negative and significant effect on human development in the short run as expected, and its effect remained significant and negative in the long run, meaning that increased corruption weakens human development.

As for the GDP per capita, it had a significant and positive effect on human development, as expected, in both the short and long run. Government expenditure's effect was insignificant in the short run but became significantly positive in the long run, as expected. While urbanization affected human development negatively in the short run, its effect became positive as expected, but insignificant, in the long run. The speed at which the variables were adjusted to their long run equilibrium was 50% within the year. In addition, the ARDL model passed all of the diagnostic tests and showed that its goodness of fit was high, which confirmed its robustness.

Since corruption has adverse consequences on economic growth and human development, governments should pursue policies to fight corruption. This will positively affect people's standard of living as it will lead to quality education, efficient health facilities and good resource management (Amate-Fortes et al., 2015; Amate-Fortes et al., 2017; Iskandar & Saragih, 2018).

Policymakers can combat corruption by focusing on causes not on effects. This should be done by tackling the poverty issue, as petty corruption is motivated by poverty, targeting labor intensive growth, increasing the efficiency and effectiveness of spending on education and health as well as social programs and increasing equality in accessing education (Iskandar & Saragih, 2018; Jalal & Mustapha, 2016; Wong & Gomes, 2014).

Government intervention to control corruption in the education sector should not focus only on financing education, donations for schools and school management, but also on addressing any potential corruption related to accreditation, selection, employment and compensation of teachers (UNDP, 2011).

Another serious problem is private tutoring, which leads to a corrupt system and an informal market where students' grades depend more on their parents desire and ability to pay than on students' performance. This phenomenon causes the deterioration of educational quality, growth potential and Egypt's competitiveness. Hence, to prevent this form of corruption, one of the proposals is to try to separate the teaching process from the assessment process. There should also be professional and strong committees authorized to employ and discharge teachers (Ille & Peacey, 2019). In addition, the absence of teachers should be limited by enforcing a disciplinary system that takes absentee rates into account (UNDP, 2011a). Increasing the number of teachers may increase competition between them, and consequently decrease the potential income from private tutoring. Besides that, more teachers may lead to smaller class sizes, which may help in better monitoring of teachers' performance and effort in class (Ille & Peacey, 2019).

As for higher education, there are attempts to fight possible corruption. For example, educational institutions develop and extensively use software programs to check for plagiarism (UNDP, 2011). In addition, reducing corruption may decrease brain drain, thus preserving our highly skilled human resources (Cooray & Schneider, 2016).

With regard to health sector, one of the main weaknesses is that intervention happens after corruption has already taken place, so the best policy is to focus on corruption prevention (UNDP, 2011a). Since many forms of corruption (theft, discrimination among medical staff, lack of accountability, etc.) may occur due to insufficient supervision, monitoring and accountability procedures, a system should be put in place to monitor the performance and attendance of medical staff, safety measures and patients' satisfaction, in addition to more frequent checkups and unexpected visits (Abdel Latif, 2013).

In general, a system of incentives and punishment should be put in place, so good performance could be rewarded, and bad conduct, especially if related to any corruption actions, could be punished. Combating corruption in the education or health sectors requires cooperation with other related sectors like finance, infrastructure, etc (UNDP, 2011a).

In addition to the above, governments can also take several actions in fighting corruption such as: promoting professional ethics in different fields in order to enhance the knowledge of concerned staff regarding the rules, regulations and laws governing their respective fields of work; enforcing more strict sanctions; establishing committees to monitor the allocation of funds and to ensure that grants are wisely used; and increasing public awareness by using mass media to educate the general public about corruption prevention.

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