



## The Impact of Human Development on the Gross Fixed Capital Formulation in Egypt

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## Abstract

“There are several studies that have focused on the direct impact of the HDI on economic growth. Likewise, there is also a focus on fixed capital formation for economic growth. While we focus in this research on the indirect impact on economic growth, by studying the impact of the increase in human capital investment on total fixed capital formation in the short and long term using the ARDL model.

we used the Auto Regressive Distributed-Lagged (ARDL) bound testing and regression analysis in order to evaluate the co-integration and measuring the latter relationship in the short and long run.”

Key Words: Fixed Capital Formation - GFCF – HDI- ARDL- Co-integration –Egypt

### الملخص

هناك العديد من الدراسات التي ركزت على التأثير المباشر لمؤشر التنمية البشرية على النمو الاقتصادي. وبالمثل هناك أيضًا تركيز على تكوين رأس المال الثابت للنمو الاقتصادي. بينما نركز في هذا البحث على التأثير غير المباشر على النمو الاقتصادي، من خلال دراسة تأثير الزيادة في استثمار رأس المال البشري على إجمالي تكوين رأس المال الثابت على المدى القصير والطويل باستخدام نموذج ARDL. استخدمنا نموذج الانحدار البطني للتوزيع التلقائي (ARDL) وتحليل تقييم الانحدار بطريقة التكامل المشترك وقياس العلاقة الأخيرة على المدى القصير والطويل.

الكلمات المفتاحية: التكوين الرأسمالي الثابت - التنمية البشرية - نموذج الانحدار البطني - طريقة التكامل المشترك - مصر.

## 1. Introduction

There is no doubt that human development has a great role in stimulating physical capital, as a lot of economic literature has confirmed this. So, the development of human capital in an economy leads to generation and absorption of technology and at the same time, technical progress will increase the incentive to invest in human development such as education and health. Hence technology is connected to investment in physical capital, there are relationships between the two types of capital. As well, by stimulating the production structure to shift from sectors with lower to higher capitalization ratios, that can consider another link between educational and physical capital can be assumed (Tamura, 2002).

This relationship justifies the limited impact of human capital on estimating growth slopes that are controlled by the accumulation of physical capital (Barrow, 1991).

In some cases, in which it was assumed that there is a constant elastic parameter of substitution among workers for a sample of countries, but no positive relationship was found between physical and human capital, according to some interpretations, this was due to the high heterogeneity of the sample of countries (Duffy et al, 2004). Some economists interpret this effect due to depending on the level of development (Goldin and Katz, 1998).

Some economists emphasize that a large part of the influence of human capital is shifted by increasing investment in physical capital. (Sianesi & Reenen (2003), Krueger & Lindahl (2001)). For example, in Vietnam, it was found that the net marginal benefit for physical capital in irrigation depends on the human capital of farmers (Walle, 2003).

On the other hand, some other economists believe that the accumulation of human capital can offset the low return on capital accumulation where the economy with a low proportion of physical capital accumulation to human capital will tend to rapid growth by increases in physical capital until a balance is achieved between the two types (Barrow, 1998).

In other words, if there is an imbalance in the economy caused by an abundance of human capital or physical capital (due to a disaster, war, or revolution, etc.), equilibrium can be achieved by increasing the lesser type (Barro and Sala-i-Martin, 1995).

From the above, it is interesting to verify whether human development really stimulates physical capital. Scientific contributions in this regard have not been agreed on a single result. but the question remains what the optimal mix of human and fixed capital in the community is.

physical Capital and human Investment are the main drivers of economic growth. Investment is divided into variable and fixed investment. Where according to Standard growth theory the level of fixed investment has a

vital role in increasing an economy's labor productivity, business competitiveness, and subsequently improve individuals` standard of living.

Egypt like many developing countries tries to direct its investment in improving human capital through investment in education and health care. But how can this augmentation affect investor's decisions in the investment in the fixed capital formulation? human development and gross fixed capital formation are both considered an essential component in stimulating and accelerating economic growth and employment, the question is to what extent is the impact of human development on the fixed capital formation (Overseas Development Institute ODI, 2016).

### 1.1. Research Problem

The issue is that increase in the level of human development may cause a decrease in the fixed capital formation of society, or that the increase of human capital in the economy makes it more effective on increasing the fixed capital formation.

### 1.2. Research Hypothesis

This research examines the following hypotheses:

- H1: human capital investment has a positive and significant impact on the gross fixed capital formulation

- H2: Increase in human capital investment drives investors to increase investment in the gross fixed capital formulation in the short run.
- H3: Increase in human capital investment decrease the investment in the gross fixed capital formulation in the long run.
- H4: Increase in Inflation rate has a positive and significant impact on the investment in the gross fixed capital formulation

### 1.3. Research Importance and Objectives

The direct impact of human capital and physical capital on economic growth has obtained the attention of many studies and has been widely analyzed in economic literature. As for the analysis of the relationship between human capital and fixed capital formation, it has not obtained enough attention and has not reached definitive conclusions. Therefore, this research aims to highlight this relationship and analyze whether the relationship is positive or negative and specifically examine if the human capital has a role in stimulating the fixed capital formation in Egypt during the period from 1990 to 2018 in the long run and short run.

### 1.4. Research Methodology

This research uses a quantitative analysis methodology based on the econometric model. The quantitative data is processed by assuming the Gross Fixed Capital Formation (GFCF) as an independent variable and Human Development (HDI) as a main dependent variable besides both unemployment and inflation rates as dependent variables. The model uses time series data which is available only from 1990 to 2018 about Egypt and depends on the method of co-integration (Autoregressive Distributed Lag Model, ARDL) through which the relationship is estimated in the long run, and depends on the Error Correction Mechanism (ECM) method to estimate the relationship in the short run, and the model is applied through the statistical program EViews.

### 1.5. Research Plan

The following of the research is organized as follows:  
in the second section, we present the descriptive analysis for variable GFCF and variable HDI which represent the main target for the study. In the third section, we present the economic model analysis, including the methodology which is applied and the results with the interpretation. In the last section, we put forward our conclusions.

## Descriptive analysis of HDI and GFCF in Egypt

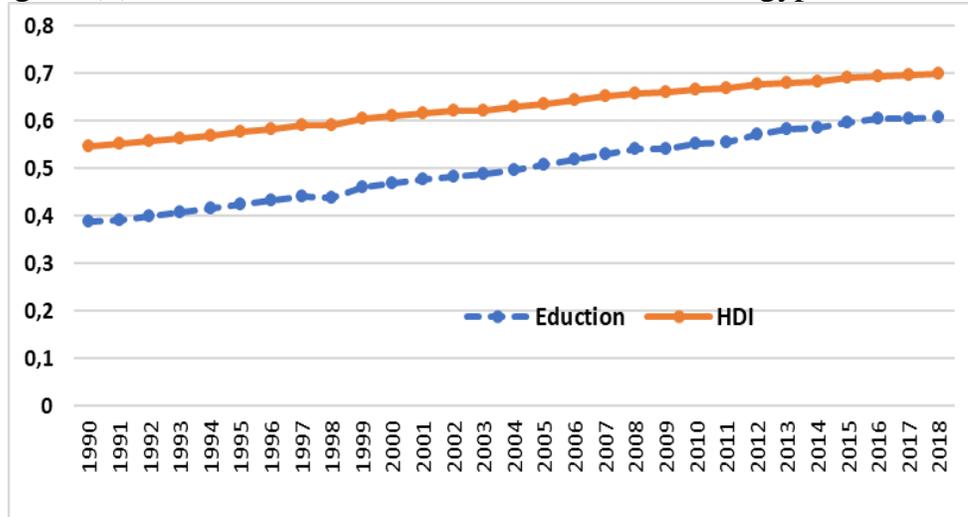
### 1.6. Human Development Index

The indicator HDI emphasizes the importance of measuring people and their capabilities and it uses as criteria for assessing the extent achieving of development of the country instead of using only economic growth. it also uses to determine national policy choices, compares between two countries with a similar level of GNI per capita, and directs government policy priorities.

The Human Development Index (HDI) is a measure of average accomplishment in three main dimensions which are long and healthy life, being knowledgeable, and a decent standard of living, it is a result of the geometric mean of normalized indicators for each of these three dimensions. The first dimension is a health and it is estimated by life expectancy at birth, the second dimension is education assessed by mean of years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering age. The standard of living represents the third dimension and it is estimated by gross national income per capita by using the logarithm of income, to make the diminishing importance of income with increasing GNI. then the three

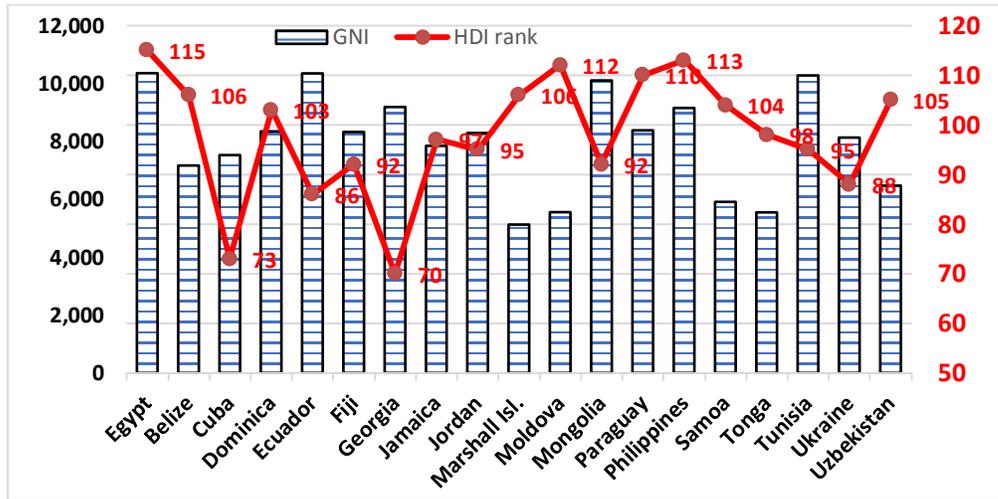
scores of Key dimensions would aggregate using the geometric mean in one Indicator which is HDI (UN, Human Development Report 2019). by this way, the HDI measures human development for all the nations of the world, it is the most broadly used gauge of human development, additionally, HDI is also considered one of the more important determinants of countries' competitiveness, its quality of human capital, and shows valuable information about a country's current development position, but HDI can't predict the future level of development (Ivanova, F.J & Srinivasan, 1999).

Figure (1) shows indicator of HDI & Education in Egypt 1990-2018.



Resource: UN Human Development Report 2019

Figure No. (2) shows a comparison between Egypt and 20 countries according to HDI (left axis) and GNI in 2017



Resource: UN Human Development Report 2019

Statistical data indicate that the human development index in Egypt is characterized by its strong correlation with the education index, and the education index is also considered the main component of the human development index. This figure is shown in figure (1).

Egypt is located in a very low position in the global ranking of the Human Development Index, which ranks 115th over the world, even though the Gross national income (GNI) per capita ((2011 PPP \$)) is higher than 20 of them in the global ranking, as the figure No. (2) shows. it means that low position in HDI due to significantly low in indicators of Education and health.

### 1.7. GFCF

The term gross fixed capital formation (GFCF) refers to one of the macroeconomic concepts utilized in official national accounts such as the United Nations System of National Accounts (UNSNA) and the European Union Accounting System (ESA).

This term first appeared in studies of the National Bureau of Economic Research (NBER) by Simon Kuznets to express capital formation in the 1930s, and its standard measures were adopted in the 1950s (Smith Kuznets, 1963).

it measures the total value of new or existing fixed assets by the business sector, governments, and "pure" households. GFCF represents a component of the expenditure on the gross domestic product (GDP), hence illustrations roughly how much of the new value-added in the economy is invested rather than consumed.

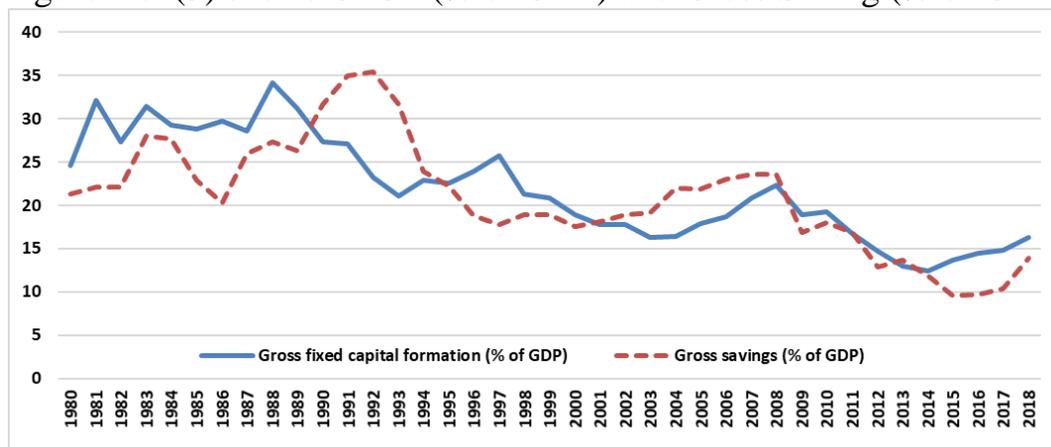
The World Bank defines Gross Fixed Capital formation as:

“Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings”. (World Bank, 2018)”

This definition is like a definition of OECD which is:

“Gross fixed capital formation as defined by the European System of Accounts (ESA) consists of resident producers’ acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-produced assets realised by the productive activity of producer or institutional units”. (OECD, 2006)

Figure No. (3) shows GFCF (% of GDP) and Gross Saving (% of GDP)



Resource: World Development Indicators 2019

The fixed capital formation has declined for the last two decades, to range between 18% and 14% of GDP, due to a decrease in the saving-to-GDP. The fixed capital formation was at its best in the 1980s, when it recorded a percentage between 34% and 27%, and then decreased in the 1990s to about 24% of GDP. this shows the figure No. (3).

It is noted that the percentage of fixed capital formation in Egypt is low compared to the countries of the Middle East & North Africa, where the average fixed capital formation rate ranges between 22-25% of GDP. The

same applies when compared to the average of countries with Upper middle income, where the ratio ranges from 24 to 31%.

## 2. Methodology

### 2.1. Data and Variables

The research uses a time series analysis of data from the period 1991 to 2018. We collected this data from the World development indicators (WDI) {of the World Bank}, the United Nations development program (UNDP). All variables are used in logarithm form.

Table No. (1): Variables

Abbreviation of Variable	Description	Source
LOG(GCF)	Real Gross Fixed Capital Formulation	World development bank <a href="https://databank.worldbank.org/home.aspx">https://databank.worldbank.org/home.aspx</a>
LOGHDI	Human Development Index	United Nations development program (UNDP). <a href="http://hdr.undp.org/en/data">http://hdr.undp.org/en/data</a>
LOGINF	Consumer Price Index (inflation ratio)	World development bank <a href="https://databank.worldbank.org/home.aspx">https://databank.worldbank.org/home.aspx</a>
LOGUNEMP	Unemployment rate	World development bank <a href="https://databank.worldbank.org/home.aspx">https://databank.worldbank.org/home.aspx</a>

## 2.2. Autoregressive Distributed Lag (ARDL)

Most of the time series data for the economic variables are non-stable (non-stationary), and in this case, if we used the traditional regression models, it is in its original form (level), we will fall in what is called spurious regression, and therefore, the regular statistical tests are not reliable.

Therefore, modern applied studies tend to rely on dynamic regression models that combine long-term and short-term relationships.

These models are used when the variables have a characteristic of co-integration, where it is assumed that economic variables tend in the long run toward a steady state (equilibrium).

Where in this case, although the variables are non-stationary on their own, if we reached a linear combination of these variables that are stationary, then we can get a meaningful and stable long-run relationship (Gujarati, & Dawn, 2009).

So, in order to examine the co-integration (long-run) relationships between variables under study, the research applied the “Autoregressive Distributed Lag” (ARDL) bounds testing procedure.

we preferred the bound testing procedure rather than other techniques of measuring co-integration because unlike Johansen co-integration approach and Engle-Granger two-stage that requires the variables under

study are integrated of the same order-, the bounds test procedure is applicable regardless whether the variables in the model are integrated at the level or the first difference (Pesaran et al., 2001). Also, the bounds test is preferred in case of a small sample size.

According to the autoregressive distributed lag (ARDL) bounds testing procedure, the null hypotheses can be stated as follow:

$$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0 \text{ (no co-integration relationship)}$$

While the alternative hypothesis,

$$H_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0 \text{ (a co-integration relationship exists)}$$

ARDL analysis is a dynamic regression model, as it implies time lags, which can measure relationships in both the long and the short term, Also ARDL allows studying short-run relationship through the unrestricted error correction model (UECM) (Vazakidis & Adamopoulos, 2010, P. 581).

In order to apply ARDL we will follow these three steps:

- First: Estimating the order of integration of variables and verifying the presence of co-integration relationship among variables of the study

- Second: Running the (ARDL) model applied to estimate the model parameters in the long term, after confirming the existence of the property of co-integration between variables
- Third: Estimating short-term relationships via the ECM

### 2.3. Unit root test

ARDL analysis allows the measurement of the relationships between variables of different levels of integration either  $I(0)$  or  $I(1)$  or both but cannot be applied if the variables are integrated of order 2. so, we run unit root test to make sure they are not integrated of order 2.

According to Augmented dickey fuller and Philips Perron Unit Root Tests, we can deduce that All variables under study are integrated of order 1 (see Table No. (1) in appendix).

### 2.4. The Optimal Lag Length

The estimation of the co-integration test and ARDL model require determining the optimal Lag length for the model variables.

This will be done by analyzing both Akaike Information Criterion (AIC) and Schwarz Bayesian Information Criterion (SBC) where choosing too many lags leads to a loss in degrees of freedom and multicollinearity.

On the other hand, choosing a smaller number of lags than optimal can cause autocorrelation. So, the optimal numbers of lags are chosen according to the lowest values for information criteria.

According to Akaike and Schwarz information criteria, the optimal lag length for the model is (2, 1, 0, 1) for the variables real gross fixed capital formation, HDI, unemployment, and CPI ratio respectively.

## 2.5. Co-integration test

To test for presence of co-integration which allow us to discover if the variables exhibit long run relationship or not, we will use ARDL bound test. Bound test t can only be used if the variables are integrated at the level or at I(1).

The null and alternative hypotheses can be stated as follow:

$$H_0: = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0 \text{ (no co-integration relationship)}$$

While the alternate hypothesis,

$$H_1: \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0 \text{ (a co-integration relationship exists)}$$

According to Pesaran et al (2001), In this test, we look whether the computed F-statistic values are located below lower bound or above

upper bounds of the critical values or between them. In case, the estimated F-statistic is below the lower bound this means that we will accept  $H_0$  and there is no-cointegration.

If the F-statistic is more than the upper bound values, then we are going to reject the null hypothesis which prove the presence of cointegration. But, if the F-statistics falls within the upper and lower limits, we cannot deduce whether there is co-integration or not.

In the case of our model, the computed f statistic is above the upper limit, so we can deduce that there is co-integration relationship among the variables of the study. (Shahbaz et al., 2008, P. 47)

there is a co-integration relationship among the variables of the study. (Shahbaz et al., 2008, P. 47)

## 2.6. Long run relationship

The general equation for the long run model is:

$$\begin{aligned} \text{LogGCF}_t = a_0 + \sum_{i=1}^p (\beta_1 \text{logGCF}_{t-i}) + \sum_{i=0}^Q (\beta_2 \text{logHDI}_{t-i}) + \sum_{i=0}^M (\beta_3 \text{LogInf}_{t-i}) \\ + \sum_{i=0}^M (\beta_4 \text{LogUnemp}_{t-i}) + U_t \end{aligned}$$

Whereas,  $p, q, m$  represents the optimal number of lags that are determined by SBC and AIC, While  $\beta_1, \beta_2, \beta_3, a_0$  represent the parameters which are elasticities in case of double log model to be estimated in the long run.

Table No. (2): Long Run Equation

Variable	Coefficient	t-Statistic	Prob.
LOG (HDI)	-1.351837	-5.321511	0.0000
LOG (UNEMP)	-0.549475	-4.959708	0.0001
LOG (INFLATION)	0.074033	2.970185	0.0079
C	3.313484	10.72075	0.0000

- We can deduce that elasticity of substitution of real gross fixed capital formulation to human capital development is 1.35 %

As HDI increase, the quality and productivity of labor increase, so the labor wages increase. Accordingly, firms tend to substitute labor with fixed capital.

Employment with high human capital also prefers obtaining high salaries and wages rather than taking the risks of engaging in private investments.

On the other hand, an increase in human capital would increase salaries and wages from this category, which is characterized by a low marginal rate of saving.

In addition, Increased spending on education and health reduces the availability of spending on physical investment.

The negative relationship can also be interpreted based on human capital that can offset the use of expensive modern machinery, equipment, or software, and vice versa, in many cases, modern devices offset the decrease in human capital from education and training and the number of workers.

- When the employment rate increases by 1 point, then the real gross fixed capital formulation will increase by 0.5 percentage in the long run.

As employment increases, the number of labor increases, who need machines and capital to work with, so firms increase their capital to cope with the increase in labor. Likewise, as employment increases, disposable income increases and increases savings Thus the investment increases.

- Also, we can find that consumer inflation has a positive and significant impact on the real gross fixed capital formulation in the long run. Where according to Adam smith theory, prices are flexible in the long run and firms adjust their product prices with respect to

inflation. So, firms tend to increase their production as prices of their products increase. And in order to increase production, they augment their investment in the fixed capital formulation.

## 2.7. Short Term Relationships

The last step in this analysis is to estimate the parameters for the short-term by applying the error correction model (ECM), ECM Is estimated by first taking the error term estimated from long-term regression equation of the basic model (ARDL) - and including in short-run equation after taking first lag to it.

Second, taking the first difference for all variables and finally using variables with lag order lower than long-run by 1

As shown in the following Equation, which represents the general formula for the error correction form equation as follows:

$$\Delta \text{LogGCF}_t = a_0 + \sum_{i=1}^{p-1} (\beta_{1i} \Delta \text{LogGCF}_{t-i}) + \sum_{i=0}^{Q-1} (\beta_{2i} \Delta \text{LogHDI}_{t-i}) + \sum_{i=0}^{M-1} (\beta_3 \Delta \text{LogINF}_{t-i}) + \varphi \text{ECT}_{t-1} + U_t$$

$\varphi$  represents the speed of adjustment in the short term to reach a stable equilibrium situation in the long term while ECT represents the correction factor as a result of the changes affecting the factors in the short run, or in other words, it shows the period of time that the

dependent variable needs in order to achieve equilibrium (co-integration) with the independent variables in the long run.

Table No. (3): Short Run Equation

ECM Regression			
Variable	Coefficient	t-Statistic	Prob.
DLOG (GROSS_FIXED_GDP (-1))	0.482558	4.276797	0.0004
DLOG (HDI)	8.574288	6.255596	0.0000
DLIOG (INFLATION)	-0.000876	-0.043067	0.9661
CointEq (-1)*	-0.781151	-8.418769	0.0000
<b>R-squared</b>			
	0.759685		
<b>Adjusted R-squared</b>			
	0.728339		
<b>Durbin-Watson stat</b>			
	0.728339		

The variable that most affects the real gross fixed capital formulation is the human development and affects positively and at the level of Significance of 1%, and the estimated parameter value indicates that the real gross fixed capital formulation increased by 8.57% As the human development index increase by 1. In the Short-term run

In the short run, firms cannot change so much in their production plans and change in the process of production. So, firms tend to invest in labor in the short run to increase production and support them with the capital needed to increase production.

ECT is significant at a level of 5% and has a negative sign.

The value of ECT parameter (-0.688) for the real gross fixed capital formulation indicates that about 68.8% of the previous year's variation due to shocks and disturbances real gross fixed capital formulation between the actual and equilibrium value of real gross fixed capital formulation in Egypt is adjusted for each year.

This means that gross fixed capital formulation returns to equilibrium after about a year and 5 months.

The explanatory ability of the model is very good, as around 75 % of changes in the real gross fixed capital formulation is explained by the variables included in the model, and it does not suffer from autocorrelation problem as shown by the Durban-Watson statistic

## 2.8. ARDL results

Table No. (3): ARDL Results

Variable	Coefficient	T-Statistic	probability
Log GFCE (-1)	0.407	2.216	0.0398

Log GFCE (-2)	-0.400	-3.3619	0.0035
Log HDI	12.67	3.511	0.0025
Log HDI (-1)	-5.889	-1.426	0.17
Log Unemp	-0.498	-3.756	0.0014
Log CPI ratio	-0.018	-0.598	0.557
Log CPI ratio (-1)	0.0845	2.865	0.0103
C	30.189	5.72	0.000
<b>R- Square d</b>	<b>0.98</b>	<b>Durbin-Watson stat</b>	<b>1.86</b>
<b>F statistic</b>	<b>179.665</b>	<b>Prob (F statistic)</b>	<b>0.00000</b>
	<b>2</b>		

## 2.9. Robustness Test

A set of tests can be made by which the suitability of the model used is judged.

The most important tests according to (Muhammed et al., 2011, PP. 62, 63 :)

1. The first test: Breusch-Godfrey (Also known as LM Test)

Autocorrelation Test

After running this test, we can notice that the value of each of the (F-statistic and Chi-Square) are insignificant which means accepting the null hypothesis ( $H_0$ ), and therefore, the model does not have a problem of autocorrelation.

## 2. The second test: Jarque-Bera (JB) Normality Test

In order to ensure that the model follows a normal distribution and, accordingly, is in line with the OLS method. We run the Jarque-Bera test. the test results show that the parameters (JB) are insignificant which means we cannot reject the null hypothesis ( $H_0$ ), and therefore, the distribution takes the moderate normal distribution

## 3. The third test: The third test: Heteroscedasticity Test

With the aim of making sure that residuals have equal variance (homoscedastic) which is one of the main OLS assumptions. And that guarantees that the estimated parameters are efficient. Therefore, the hypothesis tests are accurate, and the estimated parameters are more reliable in forecasting and, therefore, they can be Relied on them in setting economic policies. So, we run the Breusch-Pagan test.

It is concluded from test results that the model does not suffer from the problem of heteroscedasticity.

## 4. The fourth test: The Structural Stability Test of the model through CUSUMSQ and CUSUM test.

We can notice from the graphs in the appendix that both the sum of the residuals and the sum of their squares move within the limits of significance (5%). This means that stability in the coefficients over the sample period and that the model is appropriate for the analysis, and its results are of high match quality.

### 3. CONCLUSIONS

We can summarize the most important research result and recommendations in the following points:

- The research concluded that there is a sharp decrease in the human development index due to a significant decrease in indicators of education and health, and therefore the efforts must be intensified in these two sectors to improve the performance of the human development index.
- The fixed capital formation also declines as a percentage of GDP from one decade to another with a decrease in the saving to GDP, and this percentage also decreases compared to similar countries. Hence, it should encourage the savings and the factors affecting, and there is a need to research the causes of low savings rates as a percentage of GDP.

- We can deduce that elasticity of substitution of real gross fixed capital formulation to human capital development is 1.35 %
- When the employment rate increases by 1 point, then the real gross fixed capital formulation will increase by 0.5 percentage in the long run.
- that consumer inflation has a positive and significant impact on the real gross fixed capital formulation in the long run.
- The variable that most affects the real gross fixed capital formulation is the human development and affects positively and at the level of Significance of 1%, and the estimated parameter value indicates that the real gross fixed capital formulation increased by 8.57% As the human development index increase by 1. In the Short-term run
- The explanatory ability of the model is very good, as around 75 % of changes in the real gross fixed capital formulation is explained by the variables included in the model, and it does not suffer from autocorrelation problem as shown by the Durban-Watson statistic.
- We can notice from in the graphs the appendix that both the sum of the residuals and the sum of their squares move within the limits of significance (5%). This means that stability in the coefficients over the sample period and that the model is appropriate for the analysis, and its results are of high match quality.

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## Appendix

Figure No. (1) shows CUSUM test

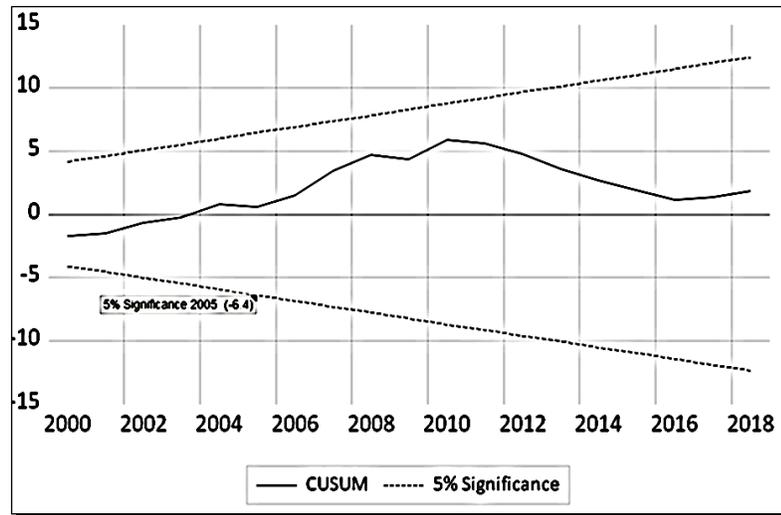
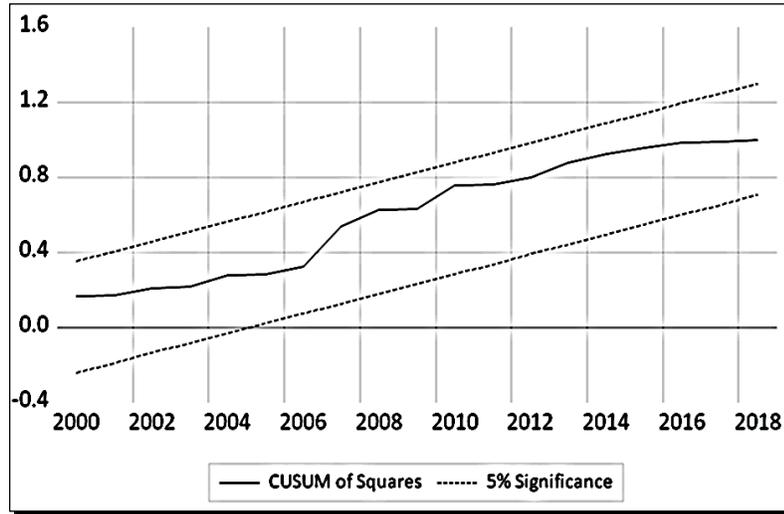


Figure No. (2) shows CUSUM of Squares



**Table No. (1): Unit Root Results**

The variable	ADF		ADF		Integration order
	Level (Intercept)	level (constant and trend)	1st. Different (Intercept)	1st. Different (constant and trend)	
Real Gross	-2.1840	-6.04	-4.59	-4.512	I (1)
Human development index	-1.800	-1.285	-5.691	-6.419	I (1)
Unemployment	-1.742	-4.548	-4.3999	-4.331	I (1)
CPI ratio (inflation)	-3.095	-3.5519	-6.97	-7.259	I (1)

**Table No. (2): Philips Perron Unit Root Test**

The variable	Level	level	1st. Different	1st. Different
	(Intercept)	(constant and trend )	(Intercept)	(constant and trend )
Real Gross fixed capital	-2.217	-2.646	-4.58	-4.5040
Human development index	-3.391	-0.997	-5.691	-8.051
Unemployment	-1.987	-2.178	-4.46	-4.39
CPI ratio (inflation)	-3.069	-3.55	-7.174	-8.26

**Table No. (3): Variables Statistics**

	CPI_inflation	HDI	UNEMP	GROSS_FIXED_CONST
<b>Mean</b>	9.985478	0.631857	10.37371	2.90E+11
<b>Median</b>	9.767323	0.632000	10.40500	2.43E+11
<b>Maximum</b>	29.50661	0.700000	13.15400	5.98E+11
<b>Minimum</b>	2.269757	0.551000	7.950000	1.11E+11
<b>Std. Dev.</b>	6.081121	0.046664	1.644227	1.29E+11
<b>Skewness</b>	1.181463	-0.172192	0.228145	0.486374
<b>Kurtosis</b>	4.955189	1.783557	1.799948	2.383357
<b>Jarque-Bera</b>				
	10.97388	1.864724	1.923045	1.547569
<b>Probability</b>				
	0.004140	0.393623	0.382310	0.461264
<b>Sum</b>				
	279.5934	17.69200	290.4640	8.13E+12
<b>Sum Sq. Dev.</b>				
	998.4610	0.058793	72.99400	4.50E+23
<b>Observations</b>				
	28	28	28	28