Impact of Gender Inequality on Economic Growth in Egypt

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Abstract

The main objective for this paper is to investigate the impact of gender inequality on GDP growth rates in Egypt. The study uses econometric analysis through co-integration model and OLS estimates to estimate the effect of gender inequality on economic growth in Egypt during the period 1988 until 2018. The study finds that Egyptian economic growth rate over through this era is significantly positively affected by the growth rates of both female and male participation in labour force and Gender Parity Index with coefficients equal 0.09, 0.75, and 0.56 respectively. These results mean that 1% increase in female participation in labour force increases GDP growth rate by around 0.1%, 1% increase in male participation in labour force increases GDP growth rate by around 0.75%, and 1% increase in Gender Parity Index increases GDP growth rate by around 0.56%.

Finally, the study recommends that the Egyptian government expands female participation in labour force through expanding education opportunities for female and stopping discrimination against female in job opportunities.

Introduction:

"Diversity is not only the right thing to do, but also the smart thing to do"; this is some words for IFC leader in Arab region as a comment on the current discrimination against women in labour market and education in Egypt. Especially in Upper Egypt, the discrimination against female is highly noted in areas such as getting job opportunities, entering secondary schools and universities, and even wealth inheritance. On the same road, Egyptian women are still paid less than men for equal work; the gender wage gap currently stands at 22 percent, according to a study published by the World Bank.

"As business leaders, entrepreneurs, employees and consumers, women are fundamental to inclusive growth—creating business models that boost job growth, build capital markets and raise per-capita incomes while promoting sustainable development," IFC official concluded. According to a recent IFC study, companies with female directors performed significantly better than those without, with a return on assets three times higher and return on equity twice as high. In Egypt, only 7 percent of firms are led by a female top executive.

Consequently, it is noted that gender inequality in winning opportunities has become one of the highest priorities to solve in the Egyptian society. From the economic perspective, gender inequality has its economic effects on economic growth and sustainable development in Egypt.

For example, female participation in the Egyptian labour force during the last thirty years seem to be 20 percent lower than its similar in Europe and USA. Of course, customs and traditions, cultural norms, and misunderstanding for religious orders are formulating together the main factors that enforce women to deviate from the labour market as a result for differentiation between men and women in the Egyptian society. The literature in searching for the impact of gender inequality on economic growth in Egypt is so limited. Of course, there is a gap in this literature. Therefore, this study tries to open a discussion towards testing the impact of this discrimination on economic growth in Egypt.

The main objective for this paper is to investigate the impact of gender inequality on GDP growth rates in Egypt. From this perspective, the paper searches for discussing several types of discrimination against female in Egypt. Consequently, discrimination against female in fields like labour market, education, political participation, and leadership in government sector. Therefore, the paper will end up with recommendations to the Egyptian government to reduce gender inequality in Egypt and to highlight steps that have to be taken by Egyptian policy makers to empower women in the workplace and political participation.

The paper will propose and answer important questions such as; What are the main forms of gender inequality in Egypt in areas of labour market, education, political participation, and leadership in government sector?, what is the impact of gender inequality on GDP growth rates in Egypt?, What are the main recommendations for the Egyptian policy makers to empower women in the workplace and political participation?

Literature Review:

(Alrakhis, 2015) is the only paper that analysed the impact of gender inequality on economic growth in a group of rich Arab countries. It used an econometric model as Ordinary Least Square (OLS) model where the annual real GDP growth rates where the dependent variable and other seven independent variables formulated the regression model. It found that there is no significant relationship between gender inequality in education and labour force on economic growth in these rich Arab countries.

Another important paper is (Ali, 2015) that tested the impact of gender inequality on economic growth in Pakistan using time series analysis and multiple regression model for the period 1980 to 2009. It found that there is a positive relationship between gender inequality and economic growth in Pakistan.

Also we find (Yumusak et al., 2013) that investigated the impact of gender inequality in education on economic growth in Turkey. It used a co-integration technique for Turkish data through the period 1968 until 2005. It found that low level of education for women has a negative impact on economic growth. Moreover, there exists a positive long-run relationship between economic development and reducing the gender gap in education.

Methodology:

Following (Alrakhis, 2015), this study will use the same OLS regression model where the dependent variable will be the annual real GDP growth rates and three independent variables are percentage of female in labour force participation, percentage of male in labour force participation, and Gender Parity Index.

This study will use an econometric model in order to investigate the impact of gender inequality in the labour force and in Education on real GDP growth rates in Egypt. Therefore, the paper uses Labour participation rates for males and females and Gender Parity Index (measuring the ratio for girls to boys enrolled at the Primary level of education in both private and public schools) in Egypt as independent variables. The dependent variable is the real GDP growth rates.

The Ordinary Least Squares (OLS) econometric model is used to get the results. Annual data will be used during the period 1988 to 2018. The data is collected from the World Bank data base "World Development Indicators" (WDI).

Econometric Analysis and Results:

The first step in this econometric analysis is to conduct Dickey Fuller test for the group of variables in this study in order to reach to stability and determine the level of integration among these variables.

Dickey Fuller Test of Unit Root to Test the Stability of Examined Variables:

In Dickey Fuller test, H0 and H1 are formulated as follows:

H0: the variable is not stable.

H1: the variable is stable.

Table 1

ADF unit root test results for Real GDP Growth Rate and The Independent Variables

Variables	ADF statistics		
	Levels form	First differenced	Second Differenced
GDP Growth Rate	5.55	1.21	-4.12
Female Percent of Labour	6.67	1.65	-8.97
Male Percent of Labour	4.65	0.41	-5.29
Gender Parity Index	2.861	0.62	-8.14

From table 1, it is noted that integration of orders zero and one are not existed for these four variables. Therefore, first and second differences have been taken in order to reach stationarity for these variables. This means that the alternative hypothesis is rejected which indicates that these variables are integrated of order higher than one. Consequently, when second differences were taken for these variables, the null hypothesis that $\alpha 1 = 1$ is rejected for all of them which indicates that these variables are integrated of order two I (2).

Table 2

Co-integration Analysis among Variables

Sample (adjusted): 6 120

Included observations: 120

Trend assumption: Linear deterministic trend

Series: GDP_RATE FEMAL_LAB MALE_LAB GENDER_INDEX

Lags interval (in second differences): 1 to 4

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.214331	68.07318	47.85613	0.0002
At most 1 *	0.165878	31.40788	29.79707	0.0323
At most 2	0.024621	3.838822	15.49471	0.9161
At most 3	0.000326	0.049599	3.841466	0.8237

Trace test indicates 2 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.214331	36.66530	27.58434	0.0026
At most 1 *	0.165878	27.56906	21.13162	0.0054
At most 2	0.024621	3.789223	14.26460	0.8809
At most 3	0.000326	0.049599	3.841466	0.8237

Max-eigenvalue test indicates 2 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Co-integrating Coefficients (normalized by b'*S11*b=I):

GDP_RATE	FEMAL_LAB	MALE_LAB	GENDER_INDEX
-1.362084	-0.103993	0.898731	0.730553
0.241698	-0.245789	-0.142347	-0.316919

-3.038806	0.055463	1.210752	0.684632
0.447594	-0.069405	0.824541	-0.457816

Unrestricted Adjustment Coefficients (alpha):

D(GDP_RATE)	0.024086	0.006283	0.020211	0.001572
D(FEMAL_LAB)	1.434830	2.200708	-0.138642	-0.011500
D(MALE_LAB)	0.077929	-0.029419	-0.002413	0.003323
D(GENDER_INDEX)	-0.113743	0.016527	-0.015978	0.009473

1 Co-integrating Equation(s):	Log likelihood	-528.0883

Normalized co-integrating coefficients (standard error in parentheses)

GDP_RATE	FEMAL_LAB	MALE_LAB	GENDER_INDEX
1.000000	0.076348	-0.659821	-0.536350
	(0.03389)	(0.12933)	(0.06862)

Adjustment coefficients (standard error in parentheses)

D(GDP_RATE)	-0.032807
	(0.01916)
D(FEMAL_LAB)	-1.954358
	(0.72467)
D(MALE_LAB)	-0.106146
	(0.02920)
D(GENDER_INDEX)	0.154927
	(0.06805)

2 Cointegrating Equation(s):	Log likelihood	-514.3038

Normalized cointegrating coefficients (standard error in parentheses)

GDP_RATE	FEMAL_LAB	MALE_LAB	GENDER_INDEX
1.000000	0.000000	-0.654871	-0.590462
		(0.12710)	(0.06926)
0.000000	1.000000	-0.064826	0.708759
		(0.74761)	(0.40738)

Adjustment coefficients (standard error in parentheses)

D(GDP_RATE)	-0.031288	-0.004049
	(0.01945)	(0.00375)
D(FEMAL_LAB)	-1.422452	-0.690122
	(0.68740)	(0.13262)
D(MALE_LAB)	-0.113257	-0.000873
	(0.02944)	(0.00568)
D(GENDER_INDEX)	0.158922	0.007766
	(0.06909)	(0.01333)

3 Cointegrating Equation(s):	Log likelihood	-512.4091

Normalized cointegrating coefficients (standard error in parentheses)

GDP_RATE	FEMAL_LAB	MALE_LAB	GENDER_INDEX
1.000000	0.000000	0.000000	0.379568
			(0.26668)

0.000000	1.000000	0.000000	0.804783
			(0.39955)
0.000000	0.000000	1.000000	1.481252
			(0.45853)

Adjustment coefficients (standard error in parentheses)

D(GDP_RATE)	-0.092705	-0.002928	0.045222
	(0.04658)	(0.00380)	(0.02113)
D(FEMAL_LAB)	-1.001147	-0.697811	0.808401
	(1.65862)	(0.13541)	(0.75237)
D(MALE_LAB)	-0.105924	-0.001007	0.071304
	(0.07106)	(0.00580)	(0.03223)
D(GENDER_INDEX)	0.207477	0.006880	-0.123922
	(0.16669)	(0.01361)	(0.07561)

In table 2, results of testing for co-integration relationships between the variables are presented. It is the first stage of (Engle and Granger, 1987) two-stage producer which is the static long-run regressions. The results from the ADF unit root tests on the residuals in every bivariate static long-run equation showed in Table 2 indicate that residuals in all static long-run equations are integrated of order two. This means that the variables in every bivariate equation are co-integrated. Therefore, there is a long-run relationship between these variables that is assured by results shown in Table 3.

Table 3 clarifies the Ordinary Least Squares (OLS) estimates between variables where GDP growth rate is the dependent variable and the other three independent variables. The results indicate that there is a static long-run relationship between the variables. Coefficients of the three independent variables are positive reflecting positive relationships between GDP growth rate and the three independent variables. The last column that represents the probabilities for these coefficients are all less than 0.05 and R-squared and Adjusted R-squared are 0.84 and 0.81 respectively which means that the positive long-run relationship between these four variables is highly significant.

Table 3

OLS Estimates between Variables and Static long-run model for the effect of Independent Variables on GDP growth rate

Dependent Variable: GDP__RATE

Method: Least Squares

Date: 05/07/19 Time: 19:13

Sample: 1 120

Included observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FEMAL_LAB	**0.096433**	1.338818	1.715269	**0.0483**
MALE_LAB	**0.752144**	0.781610	0.105096	**0.0164**
GENDER_INDEX	**0.569520**	0.403448	-3.518466	**0.0006**
C	**-0.558755**	4.669305	-0.119666	**0.0049**

R-squared	**0.841842**	Mean dependent var	0.947499
Adjusted R-squared	**0.814035**	S.D. dependent var	7.357868
S.E. of regression	7.080260	Akaike info criterion	6.777646
Sum squared resid	7669.902	Schwarz criterion	6.855512
Log likelihood	-528.0452	Hannan-Quinn criter.	6.809270
F-statistic	5.157655	Durbin-Watson stat	1.476387
Prob (F-statistic)	0.002008		

Consequently, the analysis must be transferred into the second stage of (Engle and Granger, 1987) to confirm this co-integration relationship through applying the EC models. Results for this second stage analysis are presented in the coming Table 4.

Table 4

The EC model for the impact of these three independent variables on GDP growth rate

Vector Error Correction Estimates

Date: 05/07/19 Time: 19:28

Sample (adjusted): 4 120

Included observations: 120 after adjustments

Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	
GDP_RATE(-1)	2.431110	
	(0.39780)	
	[6.11144]	
C	-14.67906	
Error Correction:	D(FEMAL_ LAB YEAR)	D(GDP_RATE)
CointEq1	0.001004	-0.273018
	(0.00179)	(0.04461)
	[0.56155]	[-6.12002]
D(MALE_LAB (-1))	**-0.057970**	0.553122
	(0.03372)	(2.08961)
	[-0.69244]	[0.26470]

D(FEMAL_LAB YEAR (-2))	**-0.021368**	-0.405956
	(0.02530)	(2.12907)
	[-0.25051]	[-0.19067]
C	**-0.373834**	-2.808608
	(0.12410)	(3.09750)
	[-3.01240]	[-0.90673]
GENDER_INDEX	**-0.034524**	1.780367
	(0.03079)	(0.76858)
	[-1.12117]	[2.31643]
(MALE_LAB)	**-0.058443**	-0.901103
	(0.01505)	(0.37565)
	[3.88325]	[-2.39880]
R-squared	**0.859113**	0.456303
Adj. R-squared	**0.811194**	0.430235
Sum sq. resids	9.561155	5956.615
S.E. equation	0.255905	6.387389
F-statistic	5.514704	17.50453
Log likelihood	-4.514739	-499.9750
Akaike AIC	0.162529	6.597078
Schwarz SC	0.320293	6.754842
Mean dependent	0.040519	-0.207532
S.D. dependent	0.281094	8.462047

Diagnostic tests for the chosen EC model
ARCH
0.34581
(0.5727)

As presented in Table 4, the model where GDP growth rate is its dependent variable and three independent variables are percentage of female in labour force participation, percentage of male in labour force participation, and Gender Parity Index contains ECM which is consistent with the previous results obtained for the static long-rum regression and the ADF unit root tests for the residuals. Moreover, it is showed that the assumptions behind this EC model are supported by the diagnostic test Autoregressive Conditional Heteroscedasticity (ARCH).

Conclusion:

The study uses econometric analysis through co-integration model and OLS estimates to estimate the effect of gender inequality on economic growth in Egypt during the period 1988 until 2018. The study finds that Egyptian economic growth rate over through this era is significantly positively affected by the growth rates of both female and male participation in labour force and Gender Parity Index with coefficients equal 0.09, 0.75, and 0.56 respectively. These results mean that 1% increase in female participation in labour force increases GDP growth rate by around 0.1%, 1% increase in male participation in labour force increases GDP growth rate by around 0.75%, and 1% increase in Gender Parity Index increases GDP growth rate by around 0.56%.

Finally, the study recommends that the Egyptian government expands female participation in labour force through expanding education opportunities for female and stopping discrimination against female in job opportunities.

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