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IMPACT OF WOMEN EDUCATION ON ECONOMIC GROWTH: AN EVIDENCE FROM PAKISTAN

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ABSTRACT

Education is the most fundamental right in the current situation, and it is an essential element of economic growth. No country can achieve economic development and goals without investing in education. Pakistan's economic development is possible when education is equal for both men and women, but the government did not give importance to the sector as it deserved. This study investigated the determinants of female higher education in Pakistan and the impact of women's education on the economic growth of Pakistan. This study utilized time-series data from 1991 to 2019. The autoregressive distribution lag (ARDL) model is applied to estimate the impact. The result shows that in Pakistan, education expenditure has no positive effect on female education. In contrast, a positive relationship between female higher education and GDP growth exists, but this relation is not strong in the short run and long run.

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INTRODUCTION

Education is the most potent instrument and pillar of sustainable growth for the economy in a country. The development and prosperity of the country depend on equal educational choices for both men and women. Literature provides that strong human capital is significant evidence for economic growth. A strong economy is essential for the development of any country. The economy's development means empowering individuals and communities. Every individual, whether man or woman, is the country's human capital, and human capital refers to talented people who have technical knowledge among the population of the country, including the male and female labour force. For preparing human capital, education is a significant factor in all countries (Hong et al., 2019). This study is conducted to estimate the impact of education expenditure, GDP per capita and related factors on the level of female higher education and to estimate the effect of education of females on economic growth. A

well-known saying is that if you educate a man, you educate an individual, but if you educate a woman, you educate a nation. When girls are educated, their countries become stronger and more prosperous. A woman has multiple roles to fulfill, such as a daughter, sister, wife, and mother, all at the same time. She plays a vital role in our lives in terms of our development. So without female education, it is not easy to imagine a fruitful future generation (Awan and Malik, 2020). Basic education must be available for females because females develop societies through education (Razmi et al., 2015). The facilities for education in rural areas are not as available as in urban areas. One of the main reasons for gender inequality in education is girl's schools are far away from home, and they are not allowed to go that far, especially in the rural and in remote areas of the country. There is also a shortage of educated and trained female teachers in Pakistani educational institutions. School-going girls also help in household chores, which

affect their education; cultural factors that restrict women's movement, especially between the tribal and conservation that discourage parents from sending their daughters to school. To counter and awareness campaigns to address these issues, sensitivities on gender equality and issues related to gender inequality should be highlighted to the general and rural people in particular, and the government needs to formulate population-friendly policies for girls (Khalid, 2018). The government should build new educational institutions and training centers to improve quality of education from primary to higher education level to enhance the country's economic growth (Shahid, 2014; Nowak and Dahal, 2016). Hill and King (1995) analyzed the benefits of education provision to females in terms of improvement in economic growth. They investigated how the gender gap affected social well-being from 1960 to 1985 for 96 countries developing countries. The study used the Ordinary Least Squares technique for the estimation of the results. The analysis result showed that the gender gap and female education both were essential indicators for economic growth of the country. The study's policy recommendation was that the government must design policies related to job opportunities for women and improve the level of education at primary and secondary education for females.

The rising levels of females' education can improve productivity of women in the home which is helpful for family health and children survival, and ultimately the economic growth of country (Hill and King, 1995). Abu-Rabia-Queder and Weiner-Levy (2008) documented that people have low income, particularly in rural areas in Pakistan, and there is a huge difference in education equality between males and females. They indicated that the economic growth of the country decreased during 1970 to 1985, and among many factors, insufficient investment on females' education was one of them. Noureen (2011) explained the education role in the development of human society, and the purpose of the research was to show the importance of education for females in a country's development. Results indicated that education is a major factor for the country's economic and social development. Education plays a vital role in developing human skills and providing leadership to the country. Similarly, Fatima (2011) investigated the relationship between female education and the country's GDP growth and examined the effect of female contribution in labour force participation. The number of observations covered 27 years (1980 to 2006). The technique of Ordinary Least Square (OLS), unit root test, Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) were used in the study.

Findings showed that there was no strong relationship between female education level and economic growth because quality of primary and secondary education was not satisfying the need of the economy of Pakistan. The study suggested the government to improve the quality of education at the primary and secondary level, decrease the gender gap, improve literacy rate, and provide female learning opportunities. Basic and early education must be free in the country. Vocational and technical education also plays an important role in economic growth.

Dauda (2012) reported that women have a significant role in the country's economic development by using the data from 1975 to 2008. Analysis was done by using co-integration and error correction techniques and results demonstrated the positive effect of female education on economic growth. It was recommended that government should make policies to improve the female educational system and their enrolment so that they may contribute to the economic growth of the country. Alike, Hassan and Cooray (2015) examined the comparative effects of education using the data of eighteen Asian countries from 1970 to 2009. The study used endogenous and exogenous growth models and applied Extreme Bounds Analysis (EBA) to estimate models. The result showed a positive relationship between primary, secondary and tertiary enrolment of males and females with economic growth. Findings also showed that males and females equally participate in economic development. Likewise, Oztunc et al. (2015) studied the impact of women's education on countries' long-term economic growth and collected the data of 11 countries in Asia Pacific, a region. After analysing the data through panel regression, they reported that female enrolment in schools is a significant factor for annual per capita income growth. Alike, El Alaoui (2016) studied the relationship between women's education and GDP from 1960 to 2012 in Morocco, Egypt, Tunisia, and Algeria. Two types of panel models were used in the estimation, a general panel model and a gender panel model. Results found that positive relationship between female education and economic growth, and the study suggested that healthy and good quality female education should eliminate gender discrimination in the country.

Hassan and Rafaz (2017) study the impact of female higher education, education expenditure and fertility rate on economic growth from 1990 to 2016 in Pakistan. The study used Ordinary Least Square (OLS) for analysis. In conclusion, this study showed that female education and the female labor force significantly correlate with economic growth. The result of this study showed that

more education expenditure is a basic need for female education improvement. The Pakistan Government should pay attention to this issue and spend more on education for women and increase the quality of primary, secondary, and high-level education for women. Similarly, Hong et al. (2019) studied the effect of female education on the comprehensive growth of a country and analysed the data of 146 countries from 1950 to 2010 at five-year intervals using the Ordinary Least Squares technique. Results showed a positive impact on economic growth by decreasing gender inequality in education. They suggested that the government must encourage females' education and provide them educational facilities to promote sustainable development of the economy. Alike, Awan and Malik (2020) measured the effect of females' education on poverty in Pakistan, and collected data from 1996 to 2016 and analysed the data using ARDL approach. They found a negative relationship between poverty and female education, which means an increase in female education will reduce the poverty level.

METHODOLOGY

Autoregressive Distributed Lag (ARDL) model, Unit Root Test (ADF), Bound test, CUSUM test and diagnostic test were applied to find the final solution for research

problems and their nature of the relation. Time-series data were used for the analysis from 1991 to 2019. Data were taken from Pakistan economic survey and World Bank.

Factors of Female Higher Education

This model estimated the impact of different variables on female education. In this analysis, female higher education was the dependent variable, while independent variables were education expenditure, female vocational education, female unemployment level and GDP per capita. The explanation of variables is given in Table 1.

$$LFHE = \beta_0 + \beta_1 (LEX) + \beta_2 (LFVE) + \beta_3 (LFUN) + \beta_4 (LGDPPC) + u \tag{1}$$

Female Higher Education and Economic Growth

This model was used to check the impact of female education on economic growth. In this model, the gross domestic product was used as the dependent variable, and female higher education, education expenditure, female labour force and literacy rate were independent variables. The explanation of variables is given in Table 2.

$$LGDP = \beta_0 + \beta_1(LFHE) + \beta_2(LEX) \beta_3(LFLF) + \beta_4 (LLR) + \mu \tag{2}$$

Table 1. Description of variables.

Variables	Description	Units
LFHE	Log of Female higher education	Thousand
LEX	Log of Education Expenditure	%
LFVE	Log of Female vocational education	Thousand
LFUN	Log of Female unemployment	% of female labour force
LGDPPC	Log of GDP per capita	Current US\$

Table 2. Description of variables.

Variables	Description	Units
LGDP	Log of Gross domestic product	US dollar in Millions
LFHE	Log of Female higher education	Thousand
LEX	Log of Education expenditure	%
LFLF	Log of Female labour force	% of total labor force
LLR	Log of Literacy rate	%

RESULTS AND DISCUSSION

Table 3 shows the summary statistics of variables used in analysis to estimate the impact of different factors on female higher education. The mean, median and standard deviation of all used variables are calculated. To check the

normality of the model, descriptive statistics were used. We constructed a hypothesis, which is H0= residuals are normal, and the second is H1= residuals are not normal. The probability value of all variables was insignificant, which shows that the model's residuals were normal, so we

accepted H0 that our model was normal. Table 4 shows that the probability values of all variables are less than 0.05 at

first difference. Data are stationary at 1st difference, so we applied ARDL techniques for analyses.

Table 3. Descriptive statistics.

Variables	FHE	EX	FVE	FUN	GDPPC
Mean	2.104308	1.055660	1.626273	-0.157690	2.880085
Median	2.291269	1.053360	1.380211	-0.452225	2.874437
Maximum	2.905829	1.188803	2.195900	0.791129	3.170938
Minimum	1.066959	0.818862	1.146128	-0.612610	2.614749
Std. Dev.	0.668678	0.095310	0.418392	0.492239	0.196161
Skewness	-0.256295	-0.589869	0.063779	1.046411	0.084360
Kurtosis	1.421427	2.935897	1.117599	2.364768	1.430667
JarqueBera	3.328524	1.686702	4.301308	5.779971	3.010287
Probability	0.189330	0.430266	0.116408	0.055577	0.221985

Table 4. Unit Root Test (ADF) test.

Variables	Level		1st Difference	
	C	C and intercept	C	C and intercept
FHE	0.6324	0.9725	0.0137	0.0398
EX	0.2845	0.6431	0.0000	0.0000
FVE	0.8829	0.5784	0.0023	0.0114
FUN	0.9873	0.7374	0.0000	0.0985
GDPPC	0.8260	0.6475	0.0010	0.0068

Table 5. Results short run of ARDL model (Dependent variable: FHE).

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LOGFHE(-1)	0.979281	0.131860	7.426692	0.0000
LOG(EX)	-0.316122	0.196451	-1.609165	0.1218
LOG(FVE)	-0.054012	0.047749	-1.131176	0.2702
LOG(FUN)	0.002593	0.040835	0.063494	0.9499
LOG(GDPPC)	0.069995	0.277137	0.252564	0.8029
C	0.071117	1.582653	0.044935	0.9646
R2	0.98	D.W	Prob. F	F-statistics
Adj.R2	0.98	1.663043	0.0000	293.2452

As shown in Table 5, the R-square and adjusted R-square values reveal that the 98% impact on independent variables and variation in female education is due to independent variables. Results show that there is a negative impact of education expenditures on female higher education in the short run. Results also show that there is a negative impact of the used variable of female enrolment in vocational education on female higher education, but this effect,

as shown, is not significant. The variable of female unemployment has a positive impact on female higher education, but that impact is not significant. Per capita GDP has a positive impact on female higher education, but it is not significant.

Table 6 shows that in the long run there is a negative and significant impact of education expenditure of Pakistan on female education. The variable of female vocational education also shows that it has a negative and significant

effect on female higher education. The variable of per capita DGP has a positive and significant impact on female higher education.

Table 7 shows the descriptive statistics of all variables used in the analysis for estimating the impact of female

higher education on economic growth. Table 8 shows that the probability values of all variables are less than 0.05 at 1st difference. Data is stationary at the first difference so ARDL techniques were applied to analyse data.

Table 6. Results long-run of ARDL model.

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EX)	-1.744315	0.232141	-7.514046	0.0000
LOG(FVE)	-0.300619	0.058198	-5.165449	0.0002
LOG(FUN)	-0.046210	0.039079	-1.182492	0.2582
LOG(GDPPC)	1.865628	0.189755	9.831796	0.0000
C	-7.786200	1.164006	-6.689142	0.0000

Table 7. Descriptive statistics.

Variables	GDP	EX	FHE	FLF	LR
Mean	5.079519	0.311759	5.104308	1.231725	1.585086
Median	5.079381	0.322219	5.291269	1.240371	1.617000
Maximum	5.497714	0.397940	5.905829	1.341465	1.714330
Minimum	4.659205	0.204120	4.066959	1.086987	1.367356
Std. Dev.	0.282485	0.054688	0.668678	0.082101	0.106464
Skewness	0.029428	-0.365058	-0.256295	-0.182562	-0.757656
Kurtosis	1.512894	1.912883	1.421427	1.550926	2.174568
JarqueBera	2.676396	2.072163	3.328524	2.698367	3.597826
Probability	0.262318	0.354842	0.189330	0.259452	0.165479

Table 8. Unit Root Test (ADF) test.

Variables	Level		1st Difference	
	C	C and Intercept	C	C and intercept
GDP	0.8122	0.7063	0.0010	0.0061
FHE	0.6324	0.9725	0.0137	0.0398
EX	0.2845	0.6431	0.0000	0.0000
FLF	0.6699	0.9013	0.0006	0.0026
LR	0.1920	0.8380	0.0003	0.0004

Table 9. Results of short-run ARDL model (Dependent variable: GDP).

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LOGGDP(-1)	0.737318	0.128485	5.738567	0.0000
LOG(FHE)	0.054716	0.044895	1.218766	0.2358
LOG(EX)	0.020015	0.190656	0.104978	0.9173
LOG(FLF)	0.217712	0.388221	0.560794	0.5806
LOG(LR)	0.191223	0.207964	0.919498	0.3678
C	0.661888	0.400668	1.651962	0.1127
R2	0.9895	D.W	Prob F	F-statistics
Adj.R2	0.9871	2.038068	0.0000	417.3988

Table 10. Results of long-run of ARDL model.

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LOG(FH)	0.471310	0.045929	10.26168	0.0000
LOG(EX)	0.266979	0.132833	2.009875	0.0628
LOG(FLF)	-1.100802	0.339722	-3.240303	0.0055
LOG(LR)	0.687528	0.137235	5.009852	0.0002
C	4.312560	0.417655	10.32566	0.0000

The R-square and adjusted R-square value reveal that 98% impact on independence variables and variation in female education is due to independence variables, as shown in Table 9. There is a positive impact of female higher education on GDP, but this impact is insignificant. Education expenditure has a positive but insignificant effect on GDP. The variable of the female labour force and

literacy rate also has a positive but insignificant impact. Table 10 shows that there is a positive effect of female higher education on economic growth in the long run, but this effect is not significant. The variable of the female labour force has a negative and significant impact on the GDP of Pakistan. The literacy rate has a positive and significant effect on the economic growth of Pakistan.

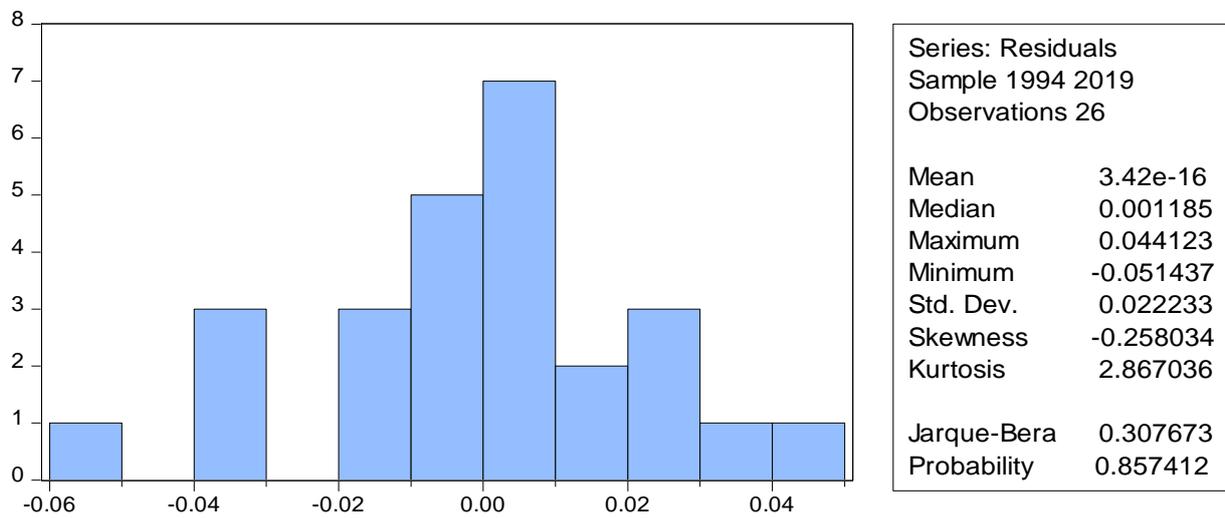


Figure 1. Normality test.

As shown in Figure 1 mean value is 3.42, which shows the average of the whole 26 observations. On average from last 29 years, all the independent variables explain in variations is dependence variable GDP. The value of the median is 0.001185. The maximum value is 0.044123 in the data that shows the possible outlier and date entry error to the maximum end. The minimum value shows that data is spread to the lowest value up to -0.051437. The skewness value is -0.258 that shows deviation from the mean. The value of kurtosis is 2.867, which shows that data is negative kurtosis. Jarque-Bera value is 0.307673, which shows that model is normal. The probability value

of the model of Jarque-Bera is 0.857, so accept the H_0 that errors are normally distributed, which is desirable. CUSUM test shown in Figure 2 demonstrates the coefficient's stability in the multiple linear regression model based on a sequence of sums, or sums of squares, of recursive residuals, computed. CUSUM test results show that the blue line lies between the red lines within the 5% critical, proving that residual variance is stable. The plots and test results at the command line indicate that coefficient. The result of CUSUM of square reveals that the blue line lies between the red lines within the 5% critical, proving that the model is stable.

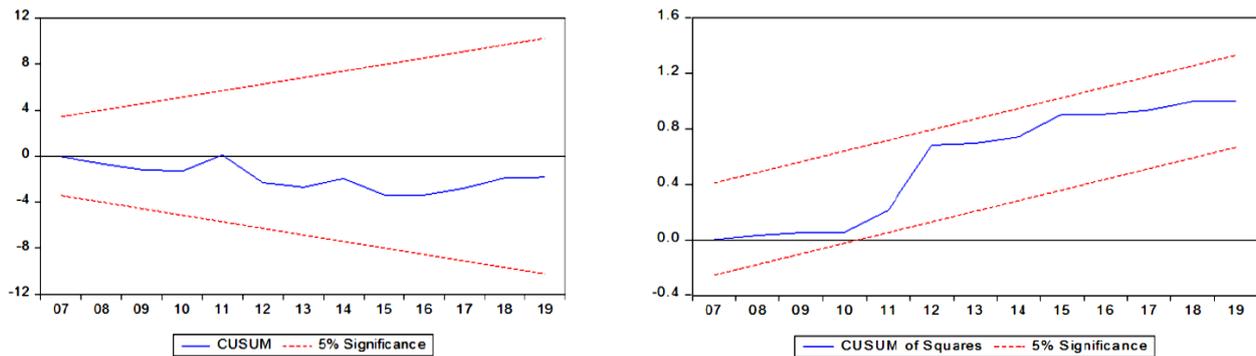


Figure 2. CUSUM test.

CONCLUSION AND RECOMMENDATIONS

Results show that in the short run, there is a negative and insignificant impact of education expenditures and female enrolment in vocational education on female higher education, while female unemployment and GDP have insignificant positive relation with female higher education in Pakistan. In the long run, there is a negative and significant impact of education expenditure and female vocational education on female higher education, while Per capita DGP has a positive and significant impact on female higher education. In the short run, there is a positive but insignificant impact of female higher education, education expenditure, female labour force and literacy rate on the economic growth of Pakistan. In the long run, the positive impact of female higher education on economic growth is also insignificant. The female labour force has a negative and significant impact, while the literacy rate has a positive and significant impact on the economic growth of Pakistan.

Estimated results showed that education expenditure did not improve the educational system for females because Pakistan's education expenditures are a minor percentage of its GDP. This low percentage could not meet the education expenditure of our country, due to which the rate of education is decreasing. Female vocational education enrolment negatively impacts female higher education enrolment because when females leave formal institutions or higher education institutions for non-formal education, the number of enrolment decreases in higher education institutions of females. Female unemployment has a negative relation with female education. When GDP per capita is improved in the country, it will also increase the living standard of people, which will pay more attention to female education. Results showed a positive relationship between female higher education and economic growth but no strong relationship in the short run and the long run. The female labour force has a negative relationship with economic growth. Female literacy level has a positive association

with national economic growth, so when females are educated, countries become stronger and more prosperous. The role of female higher education in the country's economic development is very low that is likely to change over time. With time, women will change their status through education and fulfill their responsibilities with hard work and courage. So, there is a need to increase female higher education in Pakistan because women are half of the total population. If they will be more qualified, then they would contribute more to the economic development of Pakistan. Government should allocate a significant portion of the budget for education expenditure, which will positively affect both male and female education.

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