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Mapping the Role of Fiscal Decentralization to Improve Female Human Capital: An Empirical Evidence from Pakistan

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ABSTRACT

Female human capital is particularly a crucial pathway for the development of an economy as women consist of half of human resources. Despite the increasing trend of fiscal decentralization for the improvement of various socioeconomic indicators in Pakistan, there are very few attempts on its impact on human capital. This study increases the knowledge by empirically estimating the research hypothesis that how fiscal decentralization affects female human capital in Pakistan with 18th amendment in NFC as a backdrop taking the period from 1975 to 2020. The robust analysis shows that fiscal decentralization policy is helpful to frame female human capital in Pakistan. These results are particularly important for policy formulation for provinces to increase female human capital as well as for public finance sector in Pakistan.

1. Introduction

Pakistan is a developing country and all indicators of economic development are needed to improve. It is widely considered that human capital is one of the active factors of production and economic development can never be achieved without developing human skills. Furthermore, human capital is considered as driving force to attract certain other important factors like technology and physical capital as these are vital in rising the income level. The concept of human capital was discovered in 1960s (Becker, 1967). Human capital is a complex and multidimensional concept and is defined as more investments in areas such as health, education, migration that is helpful to increase the productivity of individuals in labor and non-labor markets. It acquires physical and mental capacity of humans through health care, education, training, skill development and practice of spiritual approaches like yoga (Singh, 1999). Female human capital refers to women's education, health, labor force participation, training, skills etc.

It is traditional perception in developing countries that investment in female human capital pays more relative to male (Knowles et al., 2002). If female population is used in a better way than it brings economic growth along with social uplift of the society. Therefore, the 5th sustainable development goal is to empower all girls economically and socially to achieve gender equality. Eventually it will eradicate poverty and increase well-being of humans that is crucial for sustainable economic growth. Generally, it is acknowledged that half of the population i.e., women are undervaluing and

underutilized especially in developing countries so complete capacity of one half of their population is not explored which led to misallocation of the resources.

All over the world, governments are increasing investments in education and health sectors to achieve better human capital. Fiscal federalism theory (Oates, 1972) gives rationale for female human capital because provincial government has informational advantage regarding the needs of local female health and education and can produce better services over national policy makers. Health polices include environmental pollution regulation, disease control, water fluoridation regulation and food hygiene. In the presence of social externalities, centralized health care provision may not give desired outcomes but more welfare gains can be achieved through decentralized provision of health care services (Oates, 2005).

However, Prud'Homme (1995) said that necessities like education, health, food, infrastructure, security and many more facilities are worldwide and these are little varying regionally. So ideally, the federal government can better provide these services. Even though the cross-regional variations are known still the regional government may have less capacity to get full benefits of fiscal autonomy (Rodríguez-Pose & Krøijer, 2009).

Females in Pakistani society undergo from uneven opportunities in nutrition, health, education, and many other productive resources which impede their full potential and hence in productivity. Male are favored over female family members for health, education, quality food and facilities to get technical skill to be more productive in society. Hence, provision of equal opportunities to empower women is particularly important. Although Pakistan showed very commendable performance in social sector since independence but it is not retained throughout the history.

Female Human Capital in Pakistan

The growth of a society depends on its human capital but situation is very critical in Pakistan. Even though growth rate is significant, still indicators about human capital are not satisfactory. Most of the human capital indicators are low such as health, enrolment rate at school level, literacy rate etc. Health and education sectors are known for their significant influence on quality of human life.

Female Education

Since 1960's, the dynamic part of education in economic development has become the primary concern of research. The education of girls improved very gradually since independence in Pakistan. As per the Federal Bureau of Statistics report (50 years of Pakistan in Statistics, volume II), there were only 82 female secondary schools (18%) while the females' teachers were 800 (11%) and 8000 girls were enrolled (13%) of the total in Pakistan at the time of independence. Despite best efforts, female education has remained a neglected sector over the last years and lagged much behind.

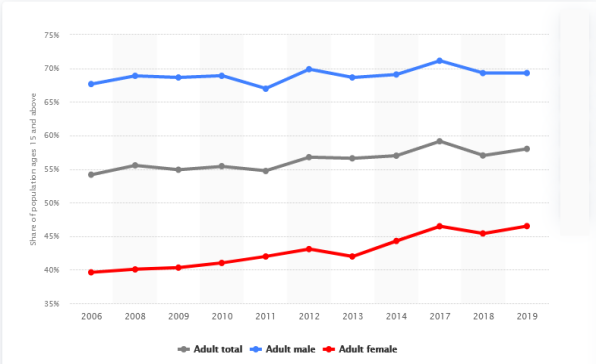

Figure1
Adult Literacy Rate by Sex in Pakistan

The data reveals that female literacy rate is very low and improving very slowly. As presented in figure 1, it was less than 40% in 2006 and increased to 49% in 2019 that is less than men. According to the United Nation sources, in 1990 there were only thirty girls in school out of every 100 girls at primary school age. Similarly, at the secondary school age, only thirteen girls out of every 100 girls were in school. In 1990 a slightly higher estimates stated by the National Education Council. According to these estimates, 2.5% students were enrolled at degree level in which 2% of women and 3% were men. The situation between urban and rural areas is even weaker. In rural areas only 7 percent, women were literate as compare to 35 percent in urban areas according to the estimates of 1981.

Official statistics of education sector of Pakistan represent a desperate situation, especially for females. As per Pakistan Social and Living Measurement (PSLM) Survey literacy rate (age 15 years and above) was 54% in 2005-06 while female literacy was only 42 % and male literacy rate was 65%. Overall literacy rate was 55 % in 2006-07 in which female literacy rate remained at 42% level and male literacy rate increased by 2% and reached to 67%. Province wise comparison displays that literacy rate of Punjab was 58% while female literacy was 48% and female literacy rate increased to 53% in 2019-20. Female literacy rate in Sindh was 42% in 2006 and it reached to 47% in 2012. KPK had female literacy rate 28% in 2006 and improved it to 45% in 2019. Baluchistan has alarming situation regarding female literacy rate as it is at lower level of all provinces with 22% in 2006 with a minor increase of 26% in 2019. Pakistan Social and Living Measurement (PSLM) literacy rates for female are consistently lower than rates of men.

Table 1

Literacy rates (15 years and above) for males and females, by provinces

Provinces	2006-07			2007-8			2019-20		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Punjab	67	48	58	70	48	59	70	53	61
Sindh	67	42	55	69	42	56	68	45	57
KPK	67	28	47	68	33	49	68	30	49
Baluchistan	58	22	42	66	23	46	59	26	44
Pakistan over all	67	42	55	69	44	56	68	46	57

*Population expressed as percentage. Source: various issues of Pakistan Social and Living Measurement (PSLM) Survey.

Female Health

Higher healthy population is not only linked with better individuals but it increases the human capital of a country too and positively contribute to social and economic development. Health care system in Pakistan facing numerous problems since independence. Pakistan is world's sixth largest country whose population living in urban and rural areas. The infrastructure of health care system is undeveloped as basic health units in several rural areas are not well equipped and unavailability of doctors is another major issue. Aiming the golden rule of "Health is wealth", the government of Pakistan must take proper actions for the betterment of health services in Pakistan.

The Figure 2 is showing female health indicators are not much satisfactory as compare to other countries in the region. The bad health of a women adversely effects the health of their children, household productivity and hence economy. Pakistan took number of steps to improve the female health such as lady health workers, extended immunization programs, cancer treatment, nutritional and child survival etc. Pakistan has the highest child and women mortality rates in the South Asia region making it difficult to meet the SDGs on child mortality, maternal health, malaria, and several other diseases. It is necessary to decrease the infant mortality rate to 40 deaths per 1,000 live births and decline under-five mortality rate to 52 deaths per 1,000 live births to meet the SDGs on health in

Pakistan. The Expanded Program on Immunization (EPI) in Pakistan has intended to considerably rise health of child and pregnant women through immunization against tuberculosis (TB), hepatitis B, diphtheria, pertussis, tetanus, measles, and poliomyelitis. But many targets have still not been met like the elimination of measles and polio. Female health indicators are improved as compare to previous decades but this pace of the improvement is not up to the requirement.

Table 2

Female Health Indicators

Years	Female life expectancy (years)	Female mortality rate (under five)	*Female adult mortality rate
1980	58.49	162.6	230.76
1990	61.88	136.2	194.58
2000	64.68	103.4	174.11
2010	66.99	82.3	158.43
2020	67.48	62.7	135.3

*Adult mortality rate (per 1000 female adults) ranges from age 15 to 60. Source: WDI

As reported in Table 2, in 1980's female life expectancy at birth was 58 years and it was 66 years in 2010. Numerous women, especially in rural areas, have high danger of dying because of pregnancy and childbirth problems. According to WDI, it remained high at 135 per 100,000 live births in Pakistan in 2020. According to Pakistan Fertility and Family Planning Survey (PFFPS) although infant mortality rate was declining but still it was 85–90 per 1000 live births, and more mortality was seen among girl children in 2020. In Pakistan, there is old tradition of giving birth at home is still very strong.

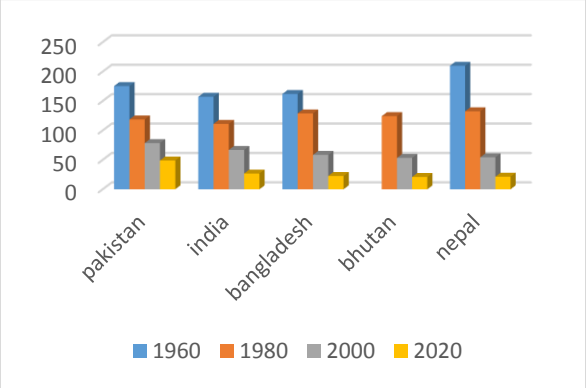

Figure 2
Trends of female infant mortality rate in South Asia region
Source: Author's own calculation.

As comparing the female infant mortality rate in Pakistan with other countries in region, Pakistan still has high mortality rates as compare to India, Bangladesh, and Bhutan. It shows the weakness of public health system in Pakistan.

Pakistan has one of the lowest public expenditures, among South Asian countries, as 0.7 percent of GDP on health and 2.8% of GDP on education. Whereas, it is 3.8% and 1.0 % of GDP in India and 5.1% and 1.1% in Nepal is allocated on education and health respectively (WHO, 2019; UNESCO, 2019; World Bank, 2019). Even Sri Lanka is spending 2.8 % of GDP on education and 1.6 % on health.

Problem Statement

After 18th amendment in 2010, Pakistani provinces have more fiscal autonomy regarding health and education expenditures. Some studies have investigated the impact of fiscal decentralization on specific public service areas like education or health (Asfaw et al., 2007; Barankay & Lockwood, 2007; Samadi et al., 2013). Faguet et al. (2021) found the impact of fiscal decentralization on female health in Ethiopia. Some studies found the influence of fiscal decentralization on gender equality (Naeem & Khan, 2021), gender parity in education (Naeem et al., 2021) and gender parity in developing Asia (Naeem & Ali, 2021). However, none has analyzed that how fiscal decentralization affects female human capital in Pakistan. Therefore, this study explores that whether a significant link between fiscal decentralization and female human capital exists or not in Pakistan.

Scope of the Study

Women have varying role in different regions so their health and education is particularly important for their effective role in society. Therefore, this study particularly examines female health and education in Pakistan. It does not include other aspects of human capital such as training, skills, etc. There are several measures in the literature for fiscal decentralization; this study takes two measures i.e., expenditure decentralization and revenue decentralization.

The first section of the study is the introduction while second section is about the literature review of the study. Third section deals with methodology and analysis of the study while fourth section is about the conclusion and recommendations.

2. Literature Review

A vast theoretical and empirical literature found decentralization beneficial for health and education services based on better knowledge argument of local government about local conditions. It stimulates the effective responses to local needs in an effective channel. Local government has cost reducing opportunity in providing social services. Literature on decentralization is expanding by taking multidimensional aspects of service delivery.

Various studies examined the impact of decentralization of particular social sector. For example, Heywood and Choi (2010), Samadi et al. (2013) and Cavalieri and Ferrante (2016) analyzed how fiscal decentralization affected health outcomes in single country. The findings of the studies suggested that fiscal decentralization improved health outcomes in different countries as there was decrease in deliveries at home but the immunization of mothers and their kids did not improve in Indonesia. This little improvement is due to structural problems, which make difficult to manage the system. It is also explored that the effect of fiscal decentralization depends on regional wealth and effect more positively the poor regions. Faguet et al. (2021) argued that that decentralization raised school enrollment rates and ratio of antenatal care of childbearing women. It is suggested that fiscal decentralization has important role in Ethiopia's success in school enrolment and female health. Human capital is one of the main determinants of employment. Naeem et al. (2022) found the evidences that fiscal decentralization is helpful to increase the female employment in Pakistan and concluded that fiscally decentralized economy can handle gender related employment activities more effectively than central government

However, the opponents of decentralization argue that regional administrations are more likely to fall in corrupt practices (Prud'Homme, 1995). They can easily be captured by elites hence there is more vulnerability of clientelism ,corruption and nepotism (Inman & Rubinfeld, 2000; Storper, 2005). Further Tanzi (1996) argued that, particularly in developing countries, local governments more commonly involved in corruption relative to central government. As local government is accountable to local voters so decentralization might generate inefficient location of facilities such as hospitals, ineffectual price for input purchasing, complex administrative paper work duplication in health and education services (Arends, 2017a). Many externalities are linked with decentralization such as immunization amenities. It is anticipated that local states may enjoy the "free-ride" on the

immunization status of their neighboring states (Jiménez-Rubio & García-Gómez, 2017). Heywood and Choi (2010) argued that decentralization of health services at district level did not improved health outcomes significantly due to administrative problems in Indonesia. Arends (2017 b) made a cross-country analysis on decentralized health sector and provided a differentiated picture about the impacts of decentralization. It argued that decentralization led to higher levels of public health spending, except for highly decentralized countries. But the high coordination costs and fragile governmental abilities are relevant with expenditure autonomy. It is seen that countries that increase decentralization at provincial level, over the time, show worse performance in health outcomes and confirm the argument that provincial planning may be poorer than central planning.

The existing theoretical and empirical literature reveals an important gap between fiscal decentralization and female human capital. After the 18th amendment in 8th NFC Award in Pakistan, provinces are fiscally more decentralized and how this autonomy affects the female human capital is still need to explore in Pakistan. Current study will cover this gap by taking two indicators of fiscal decentralization on female human capital to overcome the limitations of the previous studies.

2.1 Model Specification

The models for expenditure decentralization and revenue decentralization becomes as:

$$FSE_t = \alpha_0 + \alpha_1 DXP_t + \alpha_2 EDUEXP_t + \alpha_3 FER_t + \alpha_4 BEBTS_t + \alpha_5 GDPPPCG_t + \mu t1 \quad (1)$$

$$FSE_t = \alpha_{01} + \alpha_{11} DR_t + \alpha_{12} EDUEXP_t + \alpha_{13} FER_t + \alpha_{14} DEBTS_t + \alpha_{15} GDPPCG_t + \mu_{t2} \quad (2)$$

$$FMR_t = \beta_0 + \beta_1 DXP_t + \beta_2 VACCM_t + \beta_3 VACCT_t + \beta_4 DEBTS_t + \beta_5 GDPPCG_t + \mu_{t1} \quad (3)$$

$$\mathrm{FMR}_t = \beta_{01} + \beta_{11} DR_t + \beta_{12} VACCM_t + \beta_{13} VACCT_t + \beta_{14} DEBTS_t + \beta_{15} GDPPCG_t + \mu_{t2} \quad (4)$$

Table 3

Description of Selected Variables

Variables	Description of Variables
DXP	Decentralization of expenditures
DR	Decentralization of revenue
FSE	Female secondary school enrolment rate
FMR	Female mortality rate (under five)
EDUEXP	Education expenditures
FER	Fertility rate
VACCM	Measles vaccination
VACCT	New born protected against tetanus
DEBTS	Total debt services percentage of GDP
GDPPCG	GDP per capita growth rate

Description of Variables

Measures of Fiscal Decentralization

Two measures of fiscal decentralization are taken to empirically test its roll on female human capital. Ratio of the provincial government revenue to the total government revenue (provincial plus federal)

is used to measure decentralization of revenue (DR) (Iqbal, 2013). Decentralization of expenditure (DXP) is measured as a ratio of provincial government expenditures to the total government expenditures (provincial plus federal) (Zhang & Zou, 1998).

Female Mortality Rate (Under Five)

To measure the health status of a country, child mortality is considered as one of the best measures (Wang, 2002). The under five-mortality rate has been improved around the world in last few years. Still, the poor countries are facing large burden of child deaths. So, in this study, female child mortality under five is taken as dependent variable to estimate the female human capital.

Secondary School Enrolments Rate of Female

Education is a fundamental element of human capital formation. Education increases the quality of labor force and make it possible for skilled workers to cope with the emerging technology of the country. Female education can affect the development goals of the economy more than the education of males. For instance, girls with more and better education can help to reduce infant mortality, improve child health and nutrition, and can increase overall development process. Secondary school enrollment rate of female is taken to capture the female education to estimate the female human capital.

Public Expenditures as Percentage of GDP

Expenditure on education and health are considered as spending on human capital that indirectly have impact on economic growth. Education and health expenditure as percent of GDP are very low in Pakistan. Pakistan has lowest rank for the expenditures on education and health sectors in the SAARC region. In the history of Pakistan, the highest expenditures on education and health were 2.6 percent and 1.4 percent of GDP in 1997. Squeezing the social sector expenditures is one of the most important causes of slow economic and social development (PHCR 2003). To promote the education and health sector it is required to increase the public expenditure on both sectors.

Fertility Rate

According to WDI definition, total fertility rate (TFR) is the number of children that would be born to a woman throughout her child bearing years. TFR may have effect on the health of women and on the newborn. Families with high fertility may have limited resources per child and because of a short period between the births of children may decease breast-feeding which can threaten the nutritional status of infants.

Vaccination

Measles vaccination programs in developing countries have been repeatedly documented to be among the most cost-effective public health interventions. Morbidity and mortality in children are mostly caused by Measles infections even though effective measles containing vaccines were first developed more than 40 years ago. It is hypnotized that measles and tetanus vaccination will decrease the under five female mortality rates in Pakistan.

Gross Domestic Product Per capita Growth

Income of any country is measured through the total output of the economy. GDP per capita growth is used as measure of income. Income has great importance for human capital formation.

Total Debt Services

The huge debt obligations have adverse effects on economy.

3. Methodology

Pesaran et al. (2001) developed ARDL approach to cointegration as it estimates the conditional error correction. The following models are considered in the study.

$$\Delta FSE_t = \beta_1 + \sum_{k=1}^{\rho} \beta_k \Delta FSE_{t-k} + \sum_{n=0}^{\rho} \delta_n \Delta X_{t-n} + \varphi ECT_{t-1} + \mu_t \quad (5)$$

$$\Delta FMR_t = \beta_1 + \sum_{k=1}^{\rho} \beta_k \Delta FMR_{t-k} + \sum_{n=0}^{\rho} \delta_n \Delta X_{t-n} + \varphi ECT_{t-1} + \mu_t \quad (6)$$

To show the change in variables, the symbol Δ is used. F bound test is used to check the long run relationship between fiscal decentralization and female human capital. It has bounds of two critical values. If estimated value is greater than upper critical value then a long run relationship exists between dependent and independent variables. The coefficients of long-run and error correction model are estimated. And the equations of the conditional ECM are given in Equations. 5 and 6.

Unit Root Test

The results of Augmented Dickey-Fuller Unit Root test are presented in Table 4. It shows some variables are stationary at I(0) and some are at I(1) so they have mix order of integration.

Table 4

Results of ADF Test

Variables	I(0)		I(1)	
	t-statistics	Prob-value	t-statistics	Prob-value
DXP	-0.294	0.916	-4.915	0.003
DR	-1.923	0.319	-7.319	0.000
FSE	3.015	1.000	-3.871	0.004
FMR	-2.031	0.273	0.388	0.089
FER	-4.417	0.001	-0.239	0.925
EDUEXP	0.404	0.980	-2.907	0.052
VACCM	-1.748	0.400	-3.652	0.008
VACCT	-1.464	0.541	-4.311	0.001
DEBTS	-2.304	0.175	-9.358	0.000
GDPPCG	-1.933	0.314	-4.507	0.000

The regression results of equations 5 and 6 are reported in Table 5 and 6 and these results are robust because several diagnostic tests have applied. Long run relationship among variables, in all models, exist as F-test value lies above the upper bond value in both education and health models. The estimated coefficient show that fiscal decentralization increases the female human capital as both measures of fiscal decentralization increases the female enrolment rate and decreases the female infant mortality rate (under five) in Pakistan.

As per the Table 5, expenditure and revenue decentralization increase the female secondary school enrolment rates although revenue decentralization remained insignificant. Similarly, according to the Table 6, both measures of fiscal decentralization decrease the female infant mortality rate under five. These findings are in line with Oates (1972) theory of fiscal decentralization. Recent studies such as Cavalieri and Ferrante (2016) found that tax revenues collected by local governments along with lower transfer dependency from central government lowers the infant mortality rate in Italy.

Moreover, benefits of fiscal decentralization vary in regions and it is more favorable for poor regions. Economic growth is directly influenced by health and education sectors as modern theory of economic growth and development is dependent on human capital. In single country case, similar results are found in Pakistan (Mehmood et al., 2010;Faridi et al., 2020). Fiscal decentralization positively contributed in public education outcomes in Colombia and Pakistan respectively (Faguet et al., 2021; Rauf et al., 2017). Heredia-Ortiz (2007) argued that fiscal decentralization is necessary in

order to increase the school completion rates in developed and developing countries. These results are supported by gender related indicators also as fiscal decentralization is helpful to reduce gender disparity in education (Naeem et al., 2021). Revenue decentralization also positively affect the gender equality in education in Pakistan. But it is necessary to increase revenue collection authority by local/state governments in process of decentralization in order to get true social benefits of fiscal decentralization (Iqbal et al., 2013; Naeem et al., 2022).

Table 5

Impact of Fiscal Decentralization on Female Education

Dependent Variable= FSE		
Variables	**Model 1 Expenditure decentralization**	**Model 2 Revenue decentralization**
	F- value= 7.206 1%= (3.06 4.15)	F- value= 6.793 1%= (3.06 4.15)
DXP	6.129 (0.08)	
DR		4.277 (0.32)
EDUEXP	0.001 (0.94)	0.115 (0.00)
FER	-5.316 (0.00)	-7.057 (0.00)
DEBTS	0.011 (0.56)	-0.003 (0.87)
GDPPCG	13.599 (0.00)	8.439 (0.00)
C	-50.673 (0.05)	-7.450 (0.73)
ECM (-1)	-0.871 (0.00)	-0.930 (0.00)
	Adjusted R^2 = 0.83	Adjusted R^2 = 0.68
	D.W= 2.4	D.W= 2.5

p-values are in parenthesis.

Other control variables also influence the female health and education. As public education expenditures increase the female secondary school enrolment rate in Pakistan. Fertility rate negatively affects the female secondary school enrolment rates. A number of studies has shown that female education is associated with a decrease in fertility Sackey (2005) in Ghana, Bbaale and Mpuga (2011) in Uganda, Shakya and Gubhaju (2016) in Nepal.

Tetanus vaccination decreases the under-five mortality rate but measles vaccination increases it. WHO and UNICEF have instituted a multistage plan in 47 countries where measles rate is high. It includes the proposal to increase the effectiveness of measles vaccination, vitamin A treatment is also necessary (Organization, 2001). Multiple host and vaccine factors influence the effectiveness of measles vaccination. Age at vaccination and time of second dose are most important factors.

In many developing countries where is high risk of measles morbidity and mortality during the first year of life, WHO recommended that the first dose of measles vaccination should be done at 9 months of age (Cutts et al., 1991). If total debt services increase, it decreases the female human capital in Pakistan. Increased debt services have adverse impact on female human capital in Pakistan. These results are similar to Igudia (2021) which found negative impact of debt services on human capital in Nigeria.

Table 6

Impact of Fiscal Decentralization on Female Health

Dependent Variable= FMR		
Variables	**Model 3 Expenditure decentralization**	**Model 4 Revenue decentralization**
	F-value= 5.640 1%= (2.88 3.99)	F-value= 3.27 10%= (2.08 3)
DXP	-32.954 (0.00)	
DR		-108.3883 (0.12)
VACCM	1.198 (0.00)	1.406 (0.00)
VACCT	-0.994 (0.02)	-1.063 (0.00)
DEBTS	-0.823 (0.31)	0.499 (0.05)
GDPPCG	-115.141 (0.00)	-121.478 (0.00)
C	893.347 (0.00)	983.823 (0.00)
ECM (-1)	-0.123 (0.00)	-0.054 (0.00)
	Adjusted R^2 = 0.89 D.W= 2.6	Adjusted R^2 = 0.73 D.W= 1.9

p-values are in parenthesis.

4. Conclusion and Policy Recommendations

Fiscal decentralization not only promises economic growth but development at grass root levels. It acts as a catalyst and increase the human capital. Political, social, and economic empowerment of women is important especially for their effective role in society and hence in economic development. Formulation of female human capital is a long-term phenomenon. The current study investigates the impact of fiscal decentralization on female human capital in Pakistan over the period of 1975 to 2020. The ARDL approach is used to find the log run relationship of the variables. The findings of the study suggest that to increase the female human capital, the government of Pakistan should increase the fiscal autonomy of the provinces as regional government has more information regarding the local female health and education needs. Hence, they can allocate the expenditures effectively. Such type of public policies encourages the participation of people at a lower level, improves the delivery of social services, and provide equitable opportunities to females. Furthermore, this study has suggested that revenue decentralization is necessary along with expenditure decentralization to formulate female human capital as decentralization in both measures increases the performance of provincial government. There is vast disparity in provision of health and education services in Pakistan by public and private authorities and ultimately have different effects on human capital. Therefore, in present scenario of Pakistan, fiscal decentralization can effectively formulate female human capital.

The findings of the study are important for policy makers but it has certain limitations. As we investigated the impact of fiscal decentralization at national level. We were unable to find the impact at provisional and local level due to unavailability of the data. Moreover, other measures of fiscal decentralization can also be taken such as own revenue autonomy instead taking revenue and expenditure decentralization.

Appendix

Descriptive statistics

Variables	Mean	Std. Dev.	Min	Max
DXP	.291	.031	.246	.372
DRV	.297	.041	.193	.3821
FSE	21.452	10.178	8.623	44.032
FMR	115.145	35.354	62.7	174.2
EDUEXP	31.871	7.482	24.411	57.448
FER	5.204	1.152	3.454	6.612
VAACM	46.804	4.459	1	76
VACCT	52.956	3.555	1	85
DEBTS	25.564	8.517	9.235	40.561
GDPPCG	2.006	1.901	-1.843	6.695

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