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Socio-Economic Factors affecting labor Supply in Pakistan: An Econometric Analysis

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ABSTRACT

Socio- Economic Factors are very much important for labor supply participation in any country. Some of these factors positively affect and some negatively affect the labor force in Pakistan's economy. The data set covered the period from 1972-2020. Data is collected from Hand Book of Statistic, Pakistan Economic Survey and World Development Indicators. Total labor force is taken as a dependent variable and list of independent variables are Fertility rate, Government Current Expenditures, Total Taxes, Trade Openness, GDP Deflator, Gross Domestic Product, Literacy Rate and Life Expectancy. The objective of the study is to analyze the impact of Socio-Economic factors on total labor force in Pakistan. The novelty of this piece of research is to assess the ability and strength of labor force depending on social and economic variables that mainly affect labor supply in Pakistan. The ARDL model estimation technique is used to analyze the data. The study shows that socio-economic factors affect differently human capital formation and labor supply in case of Pakistan. The results of the study shows that life expectancy, literacy rate, gross domestic product, trade openness, government current expenditures and fertility rate are positively related with labor supply, on the other hand GDP deflator reflecting inflation in economy and total taxes are negatively related with labor supply in Pakistan. The long run and short run results of the study shows that socio-economic factors have a great impact on labor supply in Pakistan. The policy suggestions involve the role of Government to improve the social and economic condition of the economy which will be definitely helpful for betterment of labor supply in Pakistan.

1. Introduction

Labor supply is defined as the total working hours of the workers who want to work at fixed real wage rate. The labor market is a place supply and demand of labor takes place. There are different social and economic factors from different aspects that affect labor supply in Pakistan. The recent studies shows that socio-economic factors have huge impact on total labor force in Pakistan. The modern researches were constructed on numerous theoretical and the new studies based on the analysis of labor supply. There are many factors that are necessary for labor supply which are

deliberately considered good for the case of Pakistan. They can also include higher education, better health and training opportunities which are revealed crucial for the labor supply. This study focused on to build a sound and favorable long-term strategy for county's economic advancement. The objective of this research paper is the emphasis on influence of socio-economic dynamics on labor supply in country Pakistan. It is connected with the accumulation of human capital and other key determinants of human capital and labor supply.

It was analyzed that concern of the labor supply activities is very much important for the betterment of the country. It was basically on exceptional results related to migrant remittances on human capital, on the job creation and works at fixed migrant setups (Shapiro, Watson 1980 and Hall 1997). It was analyzed that movement of the labor force can assume the economy, the labor functioning and betterment of human capital formation towards labor supply improvements (Kugler, 2005). The performance of growth in Pakistan is good due to investment in human capital which is better from previous figures. The focus on achievement of higher education, skill and training can enhance overall economic well-being in Pakistan (Khan, 2005). It was studying that labor force participation rate must be increased it is very much important for any economy to grow at faster rate if its labor supply is working in good condition, otherwise it is not easy to attain the overall betterment of the economy (Azid et al., 2010). They have done a great work on the labor force participation with link to human capital formation with the different assessment and analysis techniques (Julia et al., 2015, Ali et al. 2012; Abubakar et al.2015 and Mujahid, 2014).

It was surveyed the formation of anthropological and social capital towards economic growth in Pakistan. Only poverty alleviation was least enough to get economic development. It was needed to prepare the good indicators of economic development. It was also needed to improve Human capital as a key foundation of economic expansion (Ali, et al. 2020).Human Capital formation and income disparity are both highly related with each other in the form of overall assessment of the nation's well-being. It is stated that human capital formation provides the platform for the improvement in skills and capabilities of the people in the country (Mubashir et al., 2021).

2. Literature Review

Abbas (2001), analyzed the impact of human capital and endogenous development on the comparative study of Sri Lanka and Pakistan. Trade openness and human capital were the important component to enhance the economic growth of nations. The model showed positive impact of growth and human capital.

Jolo (2002), investigated the effects of education on human capital formation in Qatar. Results showed that Qatar was developed economy by concentrating on the educational structure and human capital formation.

Kugler (2005), deliberated the impact of refugee remittances on the human capital formation and job creation by the prospect of given migration. The increase in the expected income caused to enlarge the investment on human capital investment. The model combined the building of blocks in which education, inclinations, migration, labor market and technology were included.

(Khan, 2005) considered the economic progression and human investment in Pakistan. The research absorbed that promotion in human capital and physical capital was mode to economic growth. The growth performance in the Pakistan was returned because of trade liberalization and investment in human capital. The main objective of this paper was to develope the human capital that caused to improve the labor productivity of the Pakistan.

Bergin and Kearney, 2007) observed the accumulation of human capital in labor market in 1990s in Ireland. The results showed that expert human capital does the occupation on the basis of specialization and improved the productivity.

Yasmin, (2009) studied the importance of the trade liberalization and the role of human capital. The author analyzed the potentials of work in determination of wages in Pakistan's economy. The Trade liberalization had positive impact on economic enlargement.

Komastu (2009), jagged out the quantitative investigation for local education direction in Pakistan. Due to teacher's transfers in cities was the paleness and negative fact of education system.

Gupta and Dutta (2010), investigated the wage and the unskilled and skilled labor. The author's main focus was to inspect the theoretical analysis on the expert labor force involvement. By using main factors of production as capital, land and labor.

Annabi, et al. (2011), emphasized communal expenditures for the improvement the human investment and the progress in Canada. The paper experienced the situation where communal expenses on learning were important feature to producing human investment, it had helped to increase the economic growth of that economy. The results showed more ratio of secondary schooling but short of PhD and education of master degree. The research supported the countries that needed economic growth. All those countries had immense need to put emphasis over occupational training and the technical based skills.

Gabriel and Fu (2012), considered labor immigration, the human capital accumulation impacts towards local growth rate in China's economy. Work force based movements and humanoid capital buildup had been essential for the expansion of China. Sampling technique of stratified were explored. The areas with advanced Foreign Direct Investment and additional anthropological capital collected has been further recognized. For judging the educational level GMM was used. Estimation was tested by applying technique of Chi-Square and J Statistics tests.

Hassan et al. (2012), witnessed about the remittances of workers and its importance on the human capital formation in Pakistan that had concluded the positive impacts.

Maazouz (2014), examined experimental examination of emerging nations founded on investing in the work force. The research showed that individual's existence was valued strength for a state and its progression was founded on the choices, efficiency and workforce with skill by using Biker standard. There has been positive linking between income level and education level and unemployment level. It was essential to advance the relationship of higher education and human investment and economic development.

Morrow and Bobonis (2014), searched labor pressure and human investment accumulation for the improvement of economic condition of the nation. The research paper focused the historic formation of the labor pressure to explore how the persons were required to exert their effort.

Kaas and Zink (2018), studied the investment on human capital with the labor exploration. The investment on human capital caused to the failure of capital market.

Wha Lee and Francisco (2018), examined human investment in region Asia by taking records of time series from 1970 to 2030. Between these parts, the significant emphasis was showed on high saving rate and the area's highlighted on exports. Foundation of educational growth was, children number, government policy, parent's education and income, ethics and income distribution. The relationship among educational investment, non-income and income elements was valued. The study showed positive relationship between economic growth of East Asia, and enrollment at secondary and primary levels.

Ali et al. (2020), surveyed the formation of hominoid capital formation and the economic progress in country Pakistan. Only poverty alleviation steps were not enough to get economic development but it was needed to prepare the good indicators of economic progression. The human investment was the fundamental basis of the economic enlargement.

Abbas et al. (2020), estimated the health determinants of two generations based on some key determinants i.e., mortality, fertility, nutrition. It was analyzed to check the impact of health on some different socio physical aspects of life.

3. Theoretical Support of the Study

The study based some theoretical background that justify the socio-economic factor impact on overall labor supply in Pakistan. Labor Force is equal to the sum of Employed plus Unemployed people. The labor force participation rate is attained by dividing the labor force by total population. The concept of labor supply is correlated with human capital which can be achieved through better education, better health facilities, literacy rate, and fertility rate and with the cooperation of some other socio-economic factors which are highlighted in this study.

3.1. Theory of Human Capital

Human capital basic theory deals with the proper investment in better education, training and skills of the people which can help to improve human capital in the economy.

3.2. New Classical Theory of Human Capital

This theory is based on human and social capital because socio-economic factors are basic determinants of the human capital in the economy. Labor supply and human capital highly affected from all these variables. They basically categorized mainly in the form of production function, production formation and measurement of returns.

3.3 Labor Supply Theories

3.3.1. Labor Supply Theory in Keynesian Thought

Keynes theory was based on wage rigidity of workers. The theory postulates that workers will never accept wage cut or reduction in their wage rate, they will prefer to be appreciated in form of bonuses and wage increase. The theory explain that labor supply will highly affected if wages are going to decreased, it will have a negative impact on overall labor supply.

3.3.3. Labor supply Theory in Classical Thought

Classical economics laid stress on the four main concepts related to labor supply or market. These four grounds of classical school of thought are; say's law of market, the quantity theory of money, a real wage rate theory of interest and the last one is wage and price flexibility. All these grounds have their own importance in economics but Say's law of market is more familiar in the history of classical school of thought. The law states that "Supply creates its own Demand".

3.3.4. Labor Supply Theory in Neo-Classical Thought

It is based on the labor choice of work and leisure. They believe that it is the source of individuals' utility and satisfaction. If income of the workers or labor is less then substitution of leisure or work will be more on the other hand if income of the labor is more than income effect will be greater than substitution of leisure, so he will prefer leisure over work when threshold level of income is achieved.

3.3. Rural Urban Migration Model

It is based on industrial developments of the economy when industrial sector got improved then labor migration started from rural areas to urban areas. There may be several reasons of migration of the labor i.e., rise in urban wages, the population growth, urban unemployment and lack of balanced growth between rural and urban areas.

3.4. Theories of Dual Economies

These are based on different concepts related to it as social dualism, technological dualism and financial dualism. These are based on the unequal distribution of resources of the economy overall

from rural and urban point of view. The dualistic behavior of economy affects labor supply and labor force participation rate as well.

4. Data and Methodology

4.1 Data Source and Variables

The study is constructed on analysis based on time series. The record used in this study is secondary type of data. The time period of 1972-2020 is covered. It is composed through hand book of statistics and World Development Indicator (WDI).

4.2 Variables with Expected Sign

Following table displays the expected symbols of the autonomous variables with the supported variable. All the variables are positively related with total labor force except the GDP Deflator and Taxes**.**

Table 1

Variables with Expected Sign

Variables	Sign Expected to be
FTR	Positive
GCE	Positive
TTX	Positive
TOP	Negative
GDPDEF	Positive
GDP	Negative
LTR	Positive
LEXP	Positive

Table 2

All Measurement Units of Variables

VARIABLE	DESCRIPTION	UNIT OF MEASUREMENT
FTR	Fertility Rate	Percent
GCE	Government Current Expenditures	Rupees in million
TTX	Total Taxes	Rupees in million
TLF	Labor force in Total	No. of People in million
GDPDEF	GDP Deflator	Percent
GDP	Gross Domestic Product	Rupees in million
LEXP	Expectancy of Life at birth	No. of the Years
LITR	Rate of Literacy	In term of ratio
TOP	Trade Openness	In term of ratio

The above table presents the explanation of variables with their measurement unit and abbreviations.

5. The Results of Descriptive Statistics

Table 3

Descriptive Statistics

Variables	TLF	LEXP	LITR	GDP	GDPDEF	TTX	GCE	FTR
Mean	36.94	60.91	41.71	3736146	9.12	384557	487287	5.17
Median	33.87	61.12	41.2	1563087	8.76	172488	254862	5.48
Minimum	59.32	67.12	60	14568328	21.63	1743127	2016245	6.51
Maximum	17.7	53.84	21.1	54572	0.06	5568.5	5809.3	3.06
Std. Dev.	12.85	3.68	13.41	4210387	4.86	440009.5	526386.2	1.28
Skewness	0.35	-0.16	-0.06	1.024	0.46	1.273387	1.050534	-0.26
Kurtosis	1.73	1.93	1.37	2.609	3.28	3.75148	3.22	1.32

Source: Authors Valuation in Statistical Software of E-VIEWS.

5.1 The Analysis of Correlation Matrix

The table below shows the correlation matrix values representing that there no correlation between the variables.

Table 4

Correlation Matrix

VARIABLES	TLF	LEXP	LITR	GDP	GDPDEF	TOP	TTC	GCE	FTR
TLF	1.00								
LEXPE	0.97	1.00							
LTR	0.96	0.97	1.00						
GDP	0.93	0.85	0.86	1.00					
GDPD	-0.30	-0.39	-0.31	-0.20	1.00				
TOPN	0.46	0.48	0.44	0.32	0.05	1.00			
TTAX	0.92	0.83	0.83	0.92	-0.05	0.56	1.00		
GCEX	0.95	0.87	0.88	0.92	-0.11	0.54	0.99	1.00	
FTLR	-0.97	-0.95	-0.98	-0.92	0.30	-0.41	-0.88	-0.92	1.00

Source: Authors valuation in Statistical Software of E-VIEWS.

The above table presents the correlation analysis of the variables. It shows the exact relationship of variables with each other as shown in the above table.

5.2 ARDL Cointegration Technique (Autoregressive Distributed Lag Model)

The study is based on the cointegration analysis of ARDL model estimation technique. It shows the cointegration of independent variable with dependent variable. The ARDL is used mainly on time series data analysis and shows the strength of the data corresponding to its dependent variable (Abbas et al. 2020).

5.2.1 Model Description (Specification)

The model specification is based on regression analysis. It is used to test relationship of independent and dependent variables. The following regression equation shows this relationship.

TLF= αo+ α1LITR+α2GDPDEF+α3LEXP+α4TTX+α5TOP+α6FTR+α7GCE+Ui

αo is Intercept term and α1, α2, α3, α4, α5, α6, α7 are coefficients of slope

TLF is total labor force, LITR is literacy rate, LEXP is life expectancy at birth, GDPDEF is proxy for inflation, TTX are total taxes, TOP shows trade openness, FTR denotes fertility rate and GCU expresses Government current expenditures here.

Table 5

ADF test for unit root and its Results

VARIABLES	Including intercept	Including trend and intercept	1st diff (including intercept)	1st diff including (trend and intercept)	(conclusion)
LITR	-0.5452	-0.4587	-2.5041	-4.6553	I (1)
FTR	-0.3347	-2.312	-2.7087	-10.22	I (1)
TTX	-0.6750	-2.35532	-6.73215	-6.5942	I (1)
GCE	1.8791	3.6763	-7.42	-2.2351	I (1)
TOP	-6.7455	-8.8750	-10.4740	-10.3457	I (0)
GDPDEF	-3.422058	-3.5412	-6.2467	-6.1617	I (0)
TLF	0.2687	-2.0466	-7.0029	-8.0756	I (1)
GDP	-0.1107	-2.7375	3.35333	-8.10	I (1)
LEXP	1.7658	-0.3478	-4.7327	-4.18	I (1)

Source: Authors Valuation in E-views Statistical Software.

Results of the above table displays that some of the variables are stationary at the including intercept which are actually supportive for procedures and investigation. On the other hand some of the variables are stationary at level. It is obvious also that some of the variables are stationary at difference first. The variables including LITR, FTR, TTX, GCE, TLF, GDP and LEXP are at level I (1) stationary, on the other hand some of variables including TOP and GDPDEF are at level I (0) stationary.

5.2.2 2 Co-integration Bound Test

To find out the long run relationship the ARDL estimation technique is applied. For the application of the ARDL estimation model, Cointegration for bound test is applied. The following figures expresses thee long run relationship among all of the variables.

Table 6

Bound Test for ARDL

BOUND TEST MODEL	F-Statistics	Upper-Bound Critical Value	Test Conclusion
TL/GCE,TOP,GDP,LEX,FTR,LITR,TTX,GDPD	7.836	2.84	Co integration

Source: Authors valuation in E-VIEWS Statistical Software.

The ADF (Augmented Dickey Fuller) Test is applied to check the influence of the dependent variables on independent variables. The Total labor force is taken as dependent variable and the independent variables are GCE, TOP, GDP, LEXP, FTR, LITR, TTX and GDPDEF. The second column shows the F statistics value which lies 7.836, the upper bound critical worth is 2.84. Results of the ARDL Bound test verifies that the F-Statistics values must be greater than the upper bound critical value. The above table shows and proves that F Statistics value which is 7.836 is larger than the value of upper bound critical which is 2.84 and it states that the co-integration occur. The values in above table advocates the long run association between variable in the model.

5.2.3 Error-Correction Model

Table 7

Error Correction

Variable	Co-efficient	Standard Error	t-Stats	Probability.
D(TLF(-1))	0.016617	0.169243	0.098186	0.9225
D(LEXP)	-1.913366	2.658266	-0.719780	0.4782
D(LEX(-1))	-3.191346	2.313308	-1.379559	0.1789
LTR	0.085606	0.055387	1.545613	0.1337
GDP	0.000000	0.000000	0.897927	0.3768
D(GDPD)	0.024443	0.057044	0.428498	0.6710
D(GDPD(-1))	0.121777	0.052826	2.305245	0.0197
TOPN	-4.545240	4.575227	-0.993446	0.2300
TTAX	-0.000004	0.000002	-1.565475	0.1200
D(GCEX)	-0.000000	0.000002	-0.233259	0.7175
D(FTLR)	-3.904873	6.421777	-0.608067	0.4486
D(FTLR(-1))	21.895395	9.463098	2.313766	0.0392
CointEqn(-1)	-0.581634	0.158441	-3.670989	0.0001

Cointeqn = TLF - (1.3126*LEXP +0.0000*GDP -0.0576-0.0000*TTX+ 0.32343*LITR -0.0676*GDPDEF +0.0000*GCE +4.6708*TOP + 1.6919*FTR - 68.9593)

Source: Authors valuation in E-VIEWS Statistical Software.

The Error Correction model of the short run shows the relationship among dependent variable and the list of independent variables. Values of the different variables shown the different relationships with independent variables. All the results shown in the above table are significant. The cointegration equation reveals that total labor force cointegrated with LEXP at the rate of 1.3126, GDP at 0.00000, TTX at the rate of 0.0000, LITR at 0.32343, GDPDEF at 0.0676, and GCE at the rate of 4.6708, TOP at the rate of 4.6708 and the FTR at the rate of 1.6919.

Table 8

Long Run Results

VARIABLES	Co-efficient	Standard Error	t-Stats	Probability
GCE	0.000012	0.000002	4.33333	0.0006
TOP	4.670771	4.253408	1.09812	0.2836
GDP	0.00001	0.0000006	1.66666	0.0000
LEXP	1.311642	0.350008	3.74746	0.0008
FTR	1.681762	1.217639	1.38116	0.1773
LITR	0.314323	0.156401	2.00972	0.0625
TTX	-0.000012	0.000005	-2.4	0.0101
GDPDEF	-0.06637	0.042989	-1.54388	0.2136
C	-68.959265	13.842403	-4.981741	0.0000

Source: Authors Valuation in Statistical Software of E-VIEWS.

Above table shows the long run ARDL results of the model. The model is built basically with the help of nine variables, in which 8 variables are independent variable and Total Labor Force as a dependent variable. The independent variables including the Government Current expenditures, Trade Openness, Gross Domestic Product, Life Expectancy, Fertility Rate, Literacy Rate, Total Taxes and GDP Deflator are added. It is identified that the co-efficient illustrates Connection of independent variables with the conditional variable. The values provided in the table in the form of Probability, Standard error, t. Statistics and coefficients. The Government Current Expenditures (GCE), Trade Openness (TOP), Gross Domestic Product (GDP), Life Expectancy (LEXP), Fertility Rate (FTR) and Literacy Rate (FTR) are positively related with Total Labor Force. On the other-hand the Total Taxes (TTX) and GDP Deflator (GDPDEF) are negatively related with Total Labor Force. The GCE is directly interrelated with the value of 0.000013, the TOP is linked positively with the value of 4.670, GDP is linked with the rate of 0.00001, LEXP is correlated with 1.32, FTR is associated with the value of 1.6918, LITR is positively linked with the rate of 0.3243, the TTX are related negatively with TLF with the value of -0.000012 and GDPDEF is also inversely related to TLF with the rate of -0.067637.

6. Conclusion

Labor force participation is very much important in any economy based on human capital formation. Labor supply is interlinked with socio-economic factors which affect positively and negatively. The betterment in labor force participation rate can lead to more economic developments in the country. In case of Pakistan there is unfortunately lack of well trained and skilled labor which is not so much capable to compete on world or international level. It is necessary to combat with these technical problems and make efforts to improve labor class. The socio-economic factors affect labor supply very much. The labor class is highly affected by socio-economic factors because labor is related with human capital and human capital is interlinked with different other variables i.e., skill, training,

education, literacy rate, mortality rate, fertility rate, taxes on their incomes, inflation rate and government current expenditures as well. All these factors have highly and significant impact on the labor force in Pakistan. The results of the study shows that some of these variables have positive relationship and some of these variables have negative impact on the labor supply in Pakistan. The results of the ARDL model estimation technique and long run sows that the all variables are positively related with the labor supply except GDP deflator and taxes.

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