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Article

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EuroEconomica

Provided in Cooperation with:
Danubius University of Galati

Reference: Rani, Alia/Zaman, Khalid (2018). Measuring the performance of labor market indicators on Pakistan's economic growth : time series evidence from 1975-2016. In: EuroEconomica 37 (3), S. 88 - 101.

EE
E u r o E c o n o m i c a
Issue 3(37)/2018 *ISSN: 1582-8859*

Measuring the Performance of Labor Market Indicators on Pakistan's Economic Growth: Time Series Evidence from 1975-2016

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Abstract: The objective of the study is to analyze different labor market indicators including sectoral employment, literacy rate, labor force participation rate, unemployment and educational factors, which resulting impact on Pakistan's economic growth, for a period of 1975 to 2016. The study extended neo endogenous growth theory by utilizing labor market indicators to analyze human capital reforms in a country. The study used conventional econometrics techniques, including unit root test, cointegration test and robust least squares test. The study further used impulse response function and variance decomposition analysis for inter-temporal relationship between the variables for the next ten years time period. The estimates of robust least squares regression confirmed that employment in agriculture and services sector substantially increases Pakistan's economic growth by 1.11% and 2.10% respectively. Primary and secondary school enrolment further increases country's economic growth with the elasticity estimates of 0.477% and 0.322% respectively. Economic growth influenced by high unemployment rate and low labor force participation rate, which confirmed the structural flaws in the labor market. The impact of government education expenditure on economic growth is positive, which implies that high public spending on education is imperative for economic development of a country. The policy implications could be deduce by impulse response function, which shows that labor market indicators substantially influenced Pakistan's economics growth for the next year's time period, while variance decomposition analysis confirmed that secondary school enrolment and labor force participation rate both will largely influenced per capita income for a next year's time period. The study gives new insights of the relationships that need re-corrective measures to reduce labor market rigidities with sound economic policies of a country.

Keywords: Labor market indicators; economic growth; labor force participation rate; Robust least squares regression; Pakistan.

JEL Classification: J24; O47

1. Introduction

It is quite evident that higher labour force participation rate supports country's economic growth. The labour market is considered one of the strong predictors that effect the country's sectoral contribution, hence it is deem desirable to evaluate labour market indicators in country's economic growth for sound policy implication. There are many factors that represent the labor market identities, including, population growth rate, labor force, literacy rate, employment rate, unemployment rate, labour force participation rate, etc. For improving economic growth in any country there is need to improve sustain socio-economic development and minimize the gender discrimination for inclusive growth (Ghayur, 2014). According to Fuente (2011) that introduces 3 new set of indicators for unemployment rate, including, underemployment part time workers, persons seeking work but not immediately get available and persons available to work but not seeking. Employment rate is directly connected with entrepreneurial environment of a country (Rastislav, 2011). Labor force has been facing the problem of lack of information technology's specialist, machineries and builders. There is need to create balance

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between demand and supply for work with the help of increase in work skills, education level, training programs and workshops.

According to International Labour Organization (ILO, 2016), there are 17 key indicators of labour market, i.e., labour force participation rate, employment to population rate, status in employment, employment by sector, part time sector, hours of work, employment by occupation, employment by informal economy, unemployment, youth unemployment, long term unemployment, person outside the labour force, time related unemployment, educational attainment and illiteracy, wages and compensation cost, labour productivity, and poverty income distribution and the working poor. Global economy faces some common economic environment problems like climate vulnerabilities, floods, earth quick and shortage of water etc. Environmental changes directly and indirectly affect the economic activities, i.e., a direct way, it affects the natural resources like underground shortage of water and raw material like wheat and cotton production, while an indirect way it affects the ecosystem like flood, draughts and earth quick (Everett et al., 2010). Labor market efficiency deem desirable for high economic growth. The labor productivity in majority of the cases positively correlated with the long term economic growth. It also increases the standard of living of the people in the developing countries via the channel of availability of jobs and investment in a given country. It also reduces the poverty route in sustainable way (Khan et al., 2009). Employment opportunities and labour market policies is strong base for man and women to increase the productivity, freedom, equity and security. Labour market information and analysis system (LMIA) aims to provide labour information, formulation and employment trend (ILO, 2017).

Pakistan's economy faces several challenges in history e.g. two major floods, security issues and energy crises, all are negatively affect the country's economic growth. Labour force participation rate is very essential and key indicator of economic growth of any country, for example, low female labour force participation rate in MENA countries (Egypt, Morocco, Turkey and Pakistan) substantially decline country's economic growth that gives attention to work out for women empowerment in economic development (Aboohamidi & Chidmi, 2013). Pakistan is the 6th largest population country, with a total population of 209.97 million in 2016-2017. And round about 51.78 million people participate in labour market. Pakistan is a developing country and also face sever challenges like high unemployment rate, low education level, political environment and low level of participation rate of women in labour market negatively affect the economic growth of Pakistan (GoP, 2017).

The above significant discussions need to retrieve the following study's objectives, i.e.

1) To examine the impact of sectoral employment on Pakistan's economic growth.

2) To investigate the impact of educational indicators on per capita income of a country.

3) To analyze the impact of unemployment and labor force participation rate on Pakistan's economic growth, and

4) To analysis inter-temporal relationship between labor market indicators and economic growth in the next ten years time period.

These objectives would be achieve by using sophisticated econometric techniques including cointegration, impulse response function and variance decomposition analysis for robust inferences.

2. Literature Review

The literature is widely available on unemployment and economic growth in different economic settings; however, there is a dearth of the studies to evaluate different labor market indicators on economic growth, especially for Pakistan, where market rigidities negatively affect country's economic

growth. Tyler (1981) examined the relationship between economic development and exports across developing countries and confirmed the positive relationship between them. Further, the study emphasized the need of exports oriented strategies for broad based growth. Alvarez et al (1991) argued that higher price level may sabotage the process of economic development due to lower quantity demanded; hence, it is imperative to reduce high price level to support demand and supply in a country. Borenszlein (1998) discussed the importance of foreign direct investment in development of the countries and confirmed the viability of FDI inflows in economic development, which improves technology transfer and domestic investment across countries. Barro (2001) strongly provoked in favor of educational development to accumulate human capital and confined its importance both for the gender for sustainable growth in a country. Dustmann and Fabbri (2003) discussed the importance of language in case of immigrant labours in the UK by conducting two recent surveys by which they analyzed the language efficiency and effect of language on earning level. The results confirmed the negative relationship between differences of language and the earning level, which need strong policy options to remove rigidities from labor market. Hoddinott et al. (2008) emphasized the need of health benefits all across the globe that substantially supported economic activities in countries. In this analysis, the study collected data from 1424 Guatemalan individuals' age between 25 to 42 years, time period select from 2002 to 2004. By using linear regression model, adjusting for potentially confounding factors, the results conclude that high investment of nutrition in childhood is positively associated with long term economic growth, which clearly exhibit the human investment is imperative for sound economic development.

Jensen (2007) concluded that information technology is the most important pillar of the developed and developing countries, and if this source is cheapest it works more efficiently. Information technology improve market activities and increases economic activities. In this analysis, South India introduces the mobile phone service in Kerala a state of India. The study collected the data from 1997 to 2001 by using the law of price thorium. The result shows that there is significant relationship between information technology and economic development, which further proven the consumer and producer relationship for the economic development. Head and Mayer (2010) showed that market potential and economic growth has a long term association with each other. This result is derived by using a data set from 1960 to 2003, by using bilateral trade and vector of trade. The result shows that there is positive relationship between market potential and increase in income per capita, which lead towards economic prosperity across countries. Pistoresi and Rinaldi (2012) found that easy trade policies and economic development is interlinked with economic development. By considering the case study of Italy for using the data set from 1963-2004, the results confirm the positive association between the two variables. The estimation results show that trade is not only single factor which effect the economic development, while there are number of variables for example employment, education, political environment, which may affect the process of development across the times. Khan et al (2015) confirmed the relationship between human capital and economic growth, which need re-corrective measures by increasing social development in a country. Arnold et al (2016) confirmed that banking, telecommunication, insurances and transportation sector helpful to promote country's economic growth that need easy economic policies to generate high employment in a country. Damiani et al. (2016) examined the permanent and temporary employment effect on a panel of 14 European and 10 industrialized countries by using a data set from 1995 to 2007 and confirmed that deregulation of temporary employment status negatively effect on total factor productivity, which discourages the temporary workers, hence it is vital for the government's policy makers to reduce market failures for employment generation across countries. Balcerzak and Pietrzak (2017) investigated the relationship between the quality of institutional system and utilization of potential knowledge based economy in a panel of 24 European Union countries for a period of 2004 to 2010. The results show that there is positive association between quality of institutions and human development in economic development. Gerguri-Rashiti et al. (2017) investigated the importance of

information and communication technologies and innovation activities on firm performance by collecting the data from three different time periods, i.e., 2002, 2005 and 2008, by using probit technique. The results show that by using the latest and advanced information technology improves economic growth, which support invention and innovation across countries. Opeyemic and Victor (2017) confirmed the human development by economic development that still has a debate for proposed solution. Table 1 shows the recent literature review on Pakistan's labour market.

Table 1. Recent Literatures on Labor Market Indicators and Pakistan's Economic Growth

Authors	Time Period	Results
Khaliq et al. (2017)	1990-2014	There is positive and significant relationship between female labour force participation rate and economic development of a country.
Shaheen et al. (2017)	1980-2015	Terrorism is the biggest challenge almost all for the developed and the developing countries. There is a need to take serious steps to reduce terrorism by improving education and employment across countries.
Ali et al. (2017)	1990-2012	Exports are the chief factor that supports country's economic growth.
Hussain and Saud (2017)	N/A	There is need to take steps in practically to decrease the child labour work. Government should have to re-define their policies about decent work.
Dogar and Butt (2017)	2014-2017	There is strong and significant relationship between exports, remittance, direct investment and economic development.
Fatemah and Qayyum (2018)	1971-2016	Exports, labour force, investment and domestic credit to private sector increases economic growth.
Hassan and Rafaz (2017)	1990-2016	Female education supports country's economic growth more than its counterpart.
Munir and Arshad (2018)	1973-2014	Investment in human capital leads to increase factor productivity, employment level and economic growth in a country.
Qazi et al. (2018)	1973-2012	Higher education helpful to reduce income disparity, which further confirmed with education led income distribution in a country.

These studies confirmed the viability of labor market in country's economic development, which is pivotal for sustained growth.

3. Data Source and Methodology

3.1. Data Source

The data is obtained from World development indicators published by World Bank (2017), covering a period of 1975 to 2016.

3.2. List of Variables

Table 2 shows the list of variables and their measurement.

Table 2. List of Variables

Variables	Symbols	Measurements	Data Source
Dependent Variable			
GDP	GDP	Constant 2010 US $	World Bank (2017)
Independent Variables			
Employment in agriculture	EAGR	(% of total population age 15 +) (modeled ILO estimation)	World Bank (2017)
Employment in industry	EIND	(% of total population age 15 +) (modeled ILO estimation)	World Bank (2017)
Employment in services sector	ESS	(% of total population age 15 +) (modeled ILO estimation)	World Bank (2017)
Literacy rate	LR	% of people ages 15 and above	World Bank (2017)
Primary school enrolment	PSE	% of gross enrolment	World Bank

Variables	Symbols	Measurements	Data Source
			(2017)
Secondary school enrolment	SSE	% of gross enrolment	World Bank (2017)
Education expenditure	EE	% of GDP	World Bank (2017)
Labour force participation rate	LFPR	(% of total population age 15 +) (modeled ILO estimation)	World Bank (2017)
Unemployment	UNEMP	% of total labor force	World Bank (2017)

3.3. Econometric Techniques

The following equation is used to assess the impact of labour market indicator on economic growth, i.e,

$$Ln(GDPPC)=\beta_0+\beta_1 ln(LFPR)+\beta_2 ln(EAGR)+\beta_3 ln(EIND)+\beta_4 ln(ESS)+\beta_5 ln(LR)+\beta_6 ln(UNEMP)+\beta_7 ln(PSE)+\beta_8 ln(SSE)+\beta_9 ln(EE)+\varepsilon \quad (1)$$

Where, GDPpc shows per capita GDP, LFPR shows labour force participation rate, EAGR shows employment in agriculture sector, EIND shows employment in industry sector, ESS shows employment in services sector, LR shows literacy rate, UNEMP shows unemployment rate, PSE shows primary school enrolment represent, SSE shows secondary school enrolment and EE shows education expenditures.

The study used the following economic techniques to evaluate the impact of labour market indicators on economic growth, i.e.:

i) Unit root test;

ii) Cointegration test;

iii) Robust least square regression;

iv) Impulse response function; and

v) Variance decomposition analysis;

i) Unit Root Test

The following hypothesis is evaluated in unit root test, i.e.,

H_0: Data is stationary

H_A: Data is non stationary

The augmented dickey fuller test is used to determine the variables are stationary or non stationary. If all variables are stationary on level then we used only simple least square method. But if variables are stationary on 1st difference, then we used Johansen cointegration. Similarly, if some variables are integrated at level, while some other variables are integrated at 1st level than we used ARDL model. There are three main conditions of ADF, i.e.,

- First is without intercept and trend;
- Second is without trend; and
- Third is with trend and intercept.

ii) Johansen Cointegration Test

The study used Johansen cointegration test for analyzing the long run relationship between the variables. The null hypothesis would be evaluated against the alternative hypothesis to asses' whether

the model has a long run and cointegration over a period of time. The hypothesis may be stated as follow i.e.

Ho: The model containing variables are not cointegrated

H1: The model containing variables are cointegrated

This test gives "trace statistics" and "maximum Eigen value" statistics to assess number of cointegrating equations in the model. More than one cointegrating equations in both the statistics will confirm that the model has a long run and cointegrated relationship between the variables.

iii) Robust Least Squares Regression Method

There are three methods to used robust least square regression. Firstly, if there is mixture of order of integration and most of the dependent variables are stationary at level, and then it is imperative to use multiple regression method, however, we knew that multiple regression method has serious short comings in order to increase the size of error term. Therefore, the study utilized robust least square regression that is less sensitive to outliers and hold maximum stochastic assumptions in their methodology. The robust least square regression has "M" estimation strategy that minimizes the possible outliers from the dependent variable' while remaining explanatory variables assume that there is no possible outliers in the data series. Secondly, the second strategy is "S" estimation, where dependent variable assumed to constant with no possible outliers and explanatory variables may have some deviation towards its actual steady state. Finally, the robust least square regression gives privilege to minimize both the dependent variable and explanatory variable's outlier simultaneously by including "MM" estimation. This study used "MM" estimation for counter the possible outliers of both the dependent and independent variables.

iv) Impulse Response Function (IRF)

IRF is used to observe the economic shocks of independent variables over dependent variables for next ten years time period. It is used when one's may assess the forecasted trend of the respective variables over "response" variable. This test shows the positive or negative shocks that may persist due to structural adjustment in a country and presented the deviation of the actual variables over detrended variables for next subsequent years.

v) Variance Decomposition Analysis (VDA)

The VDA also work under forecasting mechanism and to assess the relative magnitude of explanatory variables on response variables for the next ten years time period. The VDA further allows assessing the least influence and larger influence on dependent variable in inter-temporal framework.

4. Results and Discussion

Table 3 shows the descriptive statistics of the variables. The mean value of employment in agriculture (EAGR) is 46.23% of total population, employment in industry (EIND) is 19.54% of total population, and mean value of employment in services sector (ESS) is 34.22% of total population. The mean value of per capita GDP is about US$811.41, maximum value is US$1178.79, and minimum value is US$481.45. The standard deviation is about US$199.16 with positively skewed distribution and high kurtosis value. The mean value of education expenditures and literacy rate is 2.388% of GDP and 36.966% of population. The labour force participation rate has a mean value of 51.24%, maximum value is 54.37%, and minimum value is 49.19%. The mean value of primary and secondary school enrollment is about 68.503% and 26.900% gross enrolment. The unemployment rate has a mean value

of 5.93%, maximum value is 8.300%, and minimum value is 4.30%. The standard deviation is 0.84% with positively skewed distribution and high kurtosis value.

Table 3. Descriptive Statistics

Statistics	EAGR	EIND	ESS	GDPpc	EE	LR	LFPR	PSE	SSE	UNEMP
Mean	46.230	19.542	34.223	811.417	2.388	36.966	51.240	68.503	26.900	5.935
Maximum	49.800	21.200	37.500	1178.798	3.022	56.977	54.371	95.740	44.525	8.300
Minimum	42.800	17.400	32.700	481.457	1.836	25.725	49.191	49.134	16.505	4.300
Std. Dev.	1.973	0.895	1.598	199.165	0.350	13.209	1.150	16.571	8.104	0.840
Skewness	-0.536	-0.802	0.402	0.035	0.073	0.462	1.097	0.507	0.532	1.045
Kurtosis	1.790	3.691	1.578	1.967	1.993	1.451	3.493	1.554	2.327	4.466

Figure 1 shows the plots of level data for ready reference

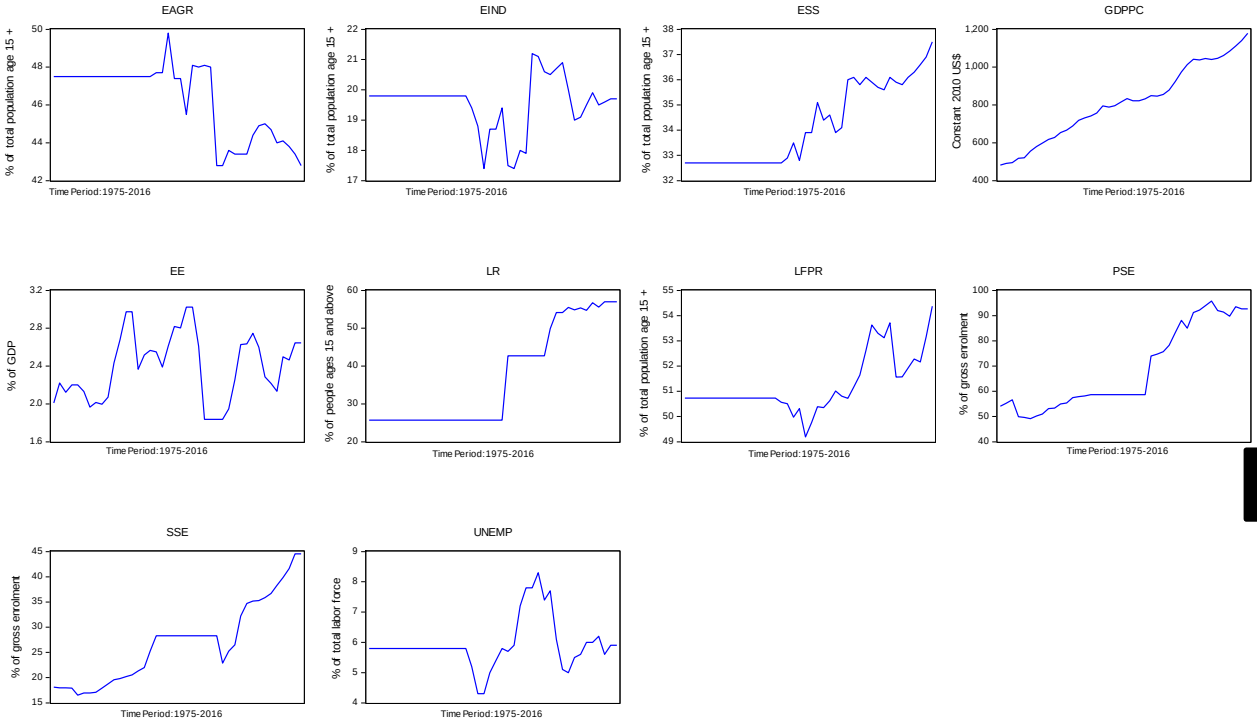

Figure 1. Plots of Level Data

Source: World Bank (2017)

Table 4 shows the estimates of correlation matrix. The results show that there is negative relationship between GDPPC and employment in agriculture sector, which implies that there is some structural flaws in market mechanism model, which needs to be rectify with labor market reforms in a country. There is positive correlation between employment in services sector, employment in industrial sector and GDPPC, which confirm that high employment in services and industrial sector substantially improve country's economic growth. The correlation results further exhibit the positive correlation of education expenditure, literacy rate, labour force participation rate, primary school enrolment, secondary school enrolment, unemployment with economic growth.

Table 4. Correlation Matrix

Correlation	EAGR	EIND	ESS	GDPPC	EE	LR	LFPR	PSE	SSE	UNEMP
EAGR	1									

EIND	-0.602	1								
	0.000	-----								
ESS	-0.895	0.184	1							
	0.000	0.243	-----							
GDPPC	-0.740	0.007	0.907	1						
	0.000	0.964	0.000	-----						
EE	0.056	-0.255	0.072	0.260	1					
	0.722	0.102	0.647	0.095	-----					
LR	-0.791	0.096	0.920	0.889	0.014	1				
	0.000	0.543	0.000	0.000	0.928	-----				
LFPR	-0.755	0.350	0.734	0.697	0.080	0.812	1			
	0.000	0.022	0.000	0.000	0.612	0.000	-----			
PSE	-0.834	0.197	0.918	0.918	0.015	0.954	0.805	1		
	0.000	0.210	0.000	0.000	0.921	0.000	0.000	-----		
SSE	-0.641	-0.120	0.856	0.945	0.300	0.849	0.649	0.858	1	
	0.000	0.446	0.000	0.000	0.052	0.000	0.000	0.000	-----	
UNEMP	-0.400	0.325	0.311	0.108	-0.558	0.257	0.119	0.248	-0.062	1
	0.008	0.035	0.044	0.494	0.000	0.099	0.451	0.113	0.694	-----

Table 5 shows the estimates of unit root test and confirm that except employment in industry and education expenditures both are the level stationary variables, which shows the order of integration is zero, i.e., I(0), while the remaining variables exhibit first differenced stationary series with order of integration is one, i.e., I(1) variables. Thus, the mixture of order of integration is reported in the given variables series, which need appropriate econometric techniques to reduce the detrended series with reduce possible outliers from the given variables.

Table 5. Augmented Dickey Fuller Test Estimates

Variables	**Level (Constant)**	**First difference (Constant)**	**Decision**
EAGR	-1.48 (0.530)	-7.43 (0.000)	I(1)
EIND	-2.82 (0.060)	-6.71 (0.0000)	I(0)
ESS	-0.03 (0.950)	-7.83 (0.0000)	I(1)
GDPpc	0.19 (0.960)	-3.94 (0.004)	I(1)
EE	-3.11 (0.033)	-4.84 (0.003)	I(0)
LFPR	-0.37 (0.904)	-5.77 (0.000)	I(1)
LR	-0.13 (0.939)	-6.17 (0.000)	I(1)
PSE	-0.02 (0.950)	-6.47 (0.000)	I(1)
SSE	-0.86 (0.99)	-4.99 (0.000)	I(1)
UNEMP	-2.51 (0.120)	-4.89 (0.000)	I(1)

Figure 2 shows the plots of differenced data for ready reference.

Figure 2. Plots of Differenced Data

Source: World Bank (2017).

Table 6 shows the Johansen cointegration test to analyze the long-run and cointegrated relationship between the candidate variables. The results confirmed the stated relationship with the aid of trace and maximum eigenvalue, as both the statistics confirmed the 4 cointegrating equations inside the mode, thus it exhibit the cointegrated relationship between the variables.

Table 6. Cointegration Estimates

Unrestricted Co integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.938153	410.7534	239.2354	0.0000
At most 1 *	0.867950	299.4298	197.3709	0.0000
At most 2 *	0.812542	218.4468	159.5297	0.0000
At most 3 *	0.763744	151.4789	125.6154	0.0005
At most 4	0.588245	93.76527	95.75366	0.0680
At most 5	0.468953	58.27217	69.81889	0.2922
At most 6	0.303887	32.95597	47.85613	0.5592
At most 7	0.250561	18.46627	29.79707	0.5318
At most 8	0.158932	6.929044	15.49471	0.5859
At most 9	0.000144	0.005756	3.841466	0.9388

Unrestricted Co integration Rank Test (Maximum Eigen value)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.938153	111.3236	64.50472	0.0000

At most 1 *	0.867950	80.98296	58.43354	0.0001
At most 2 *	0.812542	66.96795	52.36261	0.0009
At most 3 *	0.763744	57.71362	46.23142	0.0020
At most 4	0.588245	35.49310	40.07757	0.1502
At most 5	0.468953	25.31620	33.87687	0.3639
At most 6	0.303887	14.48970	27.58434	0.7874
At most 7	0.250561	11.53723	21.13162	0.5937
At most 8	0.158932	6.923288	14.26460	0.4983
At most 9	0.000144	0.005756	3.841466	0.9388

Note: 4 cointegrating equations at 0.05% confidence level.

This result further needed to find the parameter estimates of the variables, which shows the sign and size of the explanatory variables on response variable in a give time period. The study proceeds to estimate robust least square regression in Table 7 for further analysis.

Table 7. Robust Least Square Regression (RLSR) Estimates

Variables	**RLSR-1**	**RLSR-2**	**RLSR-3**
Constant	52.692	4.581*	-3.519
Ln(EAGR)	-6.206	-----	1.113**
Ln(EIND)	-2.600	-----	-----
Ln(ESS)	-4.238	-----	2.100*
Ln(SSE)	0.322*	0.382*	-----
Ln(PSE)	0.477*	0.465*	0.757*
Ln(UNEMP)	0.067	0.113**	-----
Ln(LFPR)	-0.721***	-0.365	-1.245**
Ln(EE)	0.180*	0.175*	0.2888*
Statistical Tests			
R^2	0.748	0.735	0.703
Adjusted R^2	0.687	0.698	0.662

Note: Dependent variable: Ln(GDPpc). *, **, and *** indicates 1%, 5% and 10% level of significance.

The results show that agricultural employment has a positive impact on country's economic growth as shown in third regression apparatus when industrial employment, secondary school enrolment, and unemployment being assumed to constant. The results consistent with the previous study of Awoskue (2009), which confirmed that advancement in the agricultural sector substantially improved country's GDP that needs re-corrective measures to amplify agricultural growth for long-term sustained growth. Further, the employment in services sector have a positive association with country's economic growth, as services sector consumed major proportion of employment in a country. Ahmed and Ahsan (2011) confirmed the positivity between services sector and economic growth that pivotal for economic well-being. The primary enrolment, secondary enrolment and public spending on education, all have a positive impact on Pakistan's GDP per capita, which confirmed the effectiveness of social reforms in country's policy agenda (Gumus & Kayhan, 2012). The impact of labor force participation rate is negative while unemployment shows a positive impact on country's economic growth, which indicates some structural flaws in the labor market model, which need to be rectified with sound economic policies.[1] Table 8 shows the estimates of impulse response function

Table 8. Impulse response function

Response of DLOG(GDPPC):										
Period	DLOG(GDPPC)	DLOG(EAGR)	DLOG(EIND)	DLOG(ESS)	DLOG(EEP)	DLOG(LFPR)	DLOG(LR)	DLOG(PSE)	DLOG(SSE)	DLOG(UNEMP)
2017	0.015886	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2018	-0.000120	0.002751	0.000320	-0.005167	0.004705	-0.001439	0.000903	0.001543	2.46E-05	0.000920

[1] See (Afxentiou & Serletis, 1991; Kargi, 2014; Jaumotte, 2003, etc.).

2019	0.004691	-0.000181	-0.003860	-0.004387	0.000807	-0.005096	-0.000583	-0.002265	-0.007025	-0.003827
2020	0.003126	-0.004005	-0.003140	-0.003026	-0.004732	-0.000930	-0.000968	-0.002467	-0.002447	-0.001129
2021	0.001531	0.001674	-0.000546	-0.002938	-0.000661	-0.004135	-0.003811	0.000878	-0.003161	0.000330
2022	-0.002215	0.001396	3.28E-05	-0.000583	-0.002190	-0.003808	-0.001344	0.001297	-0.002485	-0.000213
2023	-0.001101	0.002354	-0.003068	-0.001616	-0.001285	-0.002144	2.76E-05	-0.000689	-0.002811	-0.000903
2024	-0.003641	0.000129	-0.002423	0.000334	-0.000862	0.001722	0.002706	-0.000410	-0.000327	-0.000346
2025	-0.000976	-0.002126	0.000265	0.001103	0.000973	0.001047	-0.000498	-0.000283	0.000220	2.53E-05
2026	-0.000523	-0.000629	0.001377	0.001073	7.26E-05	4.26E-05	0.000168	0.000200	0.000152	0.000185

The Impuls response function shows the relationship between the variables and future prediction in the form of error shocks. The GPD per capita shows positive trend in 2017, 2019, 2020 and 2021, and negative trend in 2018, 2022, 2023, 2024, 2025 and 2026. Further, agriculture employment shows positive trend in 2017, 2018, 2021, 2022, 2023 and 2024, while it shows the negative trend in 2018, 2020, 2025 and 2026. Employment in industry sector exhibit a positive trend in 2017, 2018, 2022, 2015 and 2026, while it exhibit the negative trend in 2019, 2020, 2021, 2023 and 2014. The employment in services sector shows the positive trend in 2017, 2024, 2025 and 2026, while its negative trend in 2018, 2019, 2020, 2021, 2022 and 2023. The education expenditure shows the positive trend in 2017, 2018, 2019, 2025 and 2026, while it shows the negative trend in 2020, 2021, 2022, 2023 and 2024. The labour force participation rate exhibit the positive trend in 2017, 2024, 2025 and 2026, while the negative trend found in 2018, 2019, 2020, 2021, 2022 and 2023. The literacy rate has the positive trend in 2017, 2018, 2023, 2024 2026, and negative trend in 2019, 2020, 2021, 2022 and 2025. The primary school enrolment has positive trend in 2017, 2018, 2021, 2022 and 2026, and negative trend in2019, 2020, 2023, 2024 and 2025. The secondary school enrolment has positive trend in 2017, 2018, 2025 and 2026, and negative trend in 2019, 2020, 2021, 2022, 2023 and 2024, finally, the unemployment has positive trend in 2017, 2018, 2022, 2025 and 2026, and negative trend in 2019, 2020, 2023 and 2024. These positive and negative trends give helpful to the policy makers to device policies for improving country's economic growth by increasing sectoral employment, increase school enrolment ratio, literacy rate, and labor force participation rate. Table 9 shows the estimate of variance decomposition analysis for ready reference.

Table 9. Variance Decomposition Analysis

Variance Decomposition of DLOG(GDPPC):											
Period	S.E.	DLOG(GDPPC)	DLOG(EAGR)	DLOG(EIND)	DLOG(ESS)	DLOG(EE)	DLOG(LFPR)	DLOG(LR)	DLOG(PSE)	DLOG(SSE)	DLOG(UNEMP)
2	0.017749	80.12220	2.402126	0.032472	8.476084	7.026522	0.657149	0.258686	0.756162	0.000192	0.268405
3	0.021617	58.72192	1.626333	3.211178	9.832951	4.876300	5.999663	0.247188	1.607734	10.56090	3.315835
4	0.023445	51.70051	4.301149	4.523377	10.02504	8.218652	5.257983	0.380716	2.473827	10.06792	3.050824
5	0.024630	47.22843	4.358756	4.147463	10.50536	7.518429	7.582746	2.739162	2.368455	10.76917	2.782026
6	0.025355	45.33176	4.416307	3.914070	9.966665	7.840928	9.411699	2.866067	2.496813	11.12324	2.632445
7	0.026021	43.21995	5.011366	5.106029	9.848681	7.688401	9.615255	2.721335	2.440693	11.72843	2.619864
8	0.026604	43.21926	4.796506	5.713933	9.437525	7.460156	9.617525	3.638067	2.358677	11.23516	2.523191
9	0.026776	42.79871	5.365665	5.650592	9.486284	7.496624	9.647316	3.626110	2.339678	11.09804	2.490974
10	0.026847	42.60805	5.391943	5.883649	9.595252	7.457316	9.596042	3.610671	2.332718	11.04196	2.482403

The results of variance decomposition analysis show that GDP per capita has its own innovation shocks to represent 42.608% in the given model, while the larger influence of the variable, i.e., labor force participation rate will exert a greater variance in order to influence Pakistan's per capita income for the next 10 years time period. The least influencer would be primary school enrolment that has a variance of about 2.332% in the given model. Thus, it is conformed that labor market indicator has a viable role in order to influence country's economic growth that need corrective measures for improving labor market conditions for sustained growth.

5. Conclusions

This study assess the performance of labour market indicators in Pakistan economic growth by controlling the number of factors including employment in agriculture, employment in industry, services sector, literacy rate, primary secondary school enrolment, education expenditure, labour force participation rate, unemployment by using a time series data from 1975 to 2016. The results show that sectoral employment exhibit a positive association with country's per capita income, which further supported by educational indicators in a country. The unemployment and labour force participation rate have a differential impact on economic growth as high unemployment influenced country's economic growth, while low labour force participation rate decreases economic growth of a country. On the basis of significant results the study purposed that Government should have to reduce internal migration by providing job opportunities in the rural sector that reduce the rural urban wages differential in a country. 'Education for all' is used as a buzz word by many national and international organizations that need to be implemented in national agenda. There is a dire need to educate the labour by extensive training, research and development expenditures, symposia, hands-on-training, technical, and skill based training, which improves the labor force participation rate in a country.

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