Higher Education and Unemployment NEXUS

(A case study of Pakistan)

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Abstract

Unemployment is burning issue not only in case of developing countries but in case of developed countries also. There is large literature on unemployment both on international and national level. But this study is different as it has checked nexus between unemployment rate and higher education. Current study is based on the annual time series data over the phase of 1985 to 2018. This study applies Johansen Co-integration, Granger Causality to analyze the long run relation and measuring the causality of the policy variables. The Error correction model has also been used to check short run association among variables and adjustment of variables in short in case of fluctuations. The five equations were found Co-integrated by applying Johansen Co-integration and error term was reported as 3% which explains the annual adjustment speed in case of disequilibrium. Whereas in second model, four equation are reported to be co-integrated and ECM reflects 13 percent speed of yearly adjustment when any disequilibrium takes place in short run. The findings of Granger Causality elucidates strong nexus between the unemployment and higher education. Therefore, it is strongly recommended to have a rigorous bridging between higher education institution and corporate sector to avoid potential threat of unemployment in country.

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Chapter 1 INTRODUCTION

1.1 introduction

In economics, importance of higher education is because of its capability to create or to gather human development and by increasing the productivity level of the economy on aggregate (Núñez & Livanos, 2010). As if level of productivity will increase, the production of economy will increase and more efficiency will increase (Fischer, 1993; Gregorio, 2004). Because of these effects of human development, many countries started to invest in institutions of higher education and number of student population have dramatically risen. In 1970s alone number of universities doubled worldwide. (Bornstein & Davis, 2010, p. 10) there was more increase in number of universities in the beginning of 21st and increase in number of students more than 300% (Wolf, 2002, p. 3).

In reports of economic survey of Pakistan (2010-2011), when people cannot find a job when they are willing to do and also capable for the job, this situation is known as unemployment. Major factor inn determination of economic health of any country is if its economy maximizes efficiency by providing employment opportunities and prevailing wage rates. If individuals are unemployed in economy it indicates drain on society's resources and unproductive individuals (Rothiem, 2007). In Pakistan increasing rate in unemployment is also ever increasing phenomenon too. The rate of unemployment rose in 1900s as a result of tightening fiscal policy result. Some other factors and low rate of economic growth were are reason of increasing unemployment rate (Akhtar and Shahnz, 2005). Decreasing rate in unemployment was also observed in the time period of 2003 to 2009, but after that it has started increasing again. Unemployment rate was highest in 2004 as recorded as 8.3% and lowest as recorded in 1975 which was 1.6% in overall history of Pakistan.

Main reason for unemployment in Pakistan is as it is basically an agrarian economy but only 45% jobs are provided through agriculture sector. Because of backwardness in agriculture sector unemployment rate has been increases over the time (Labor force survey, 2011).

Higher education has a vital role in which future generations could learn and handle complexities of future. Universities educate highly qualifies people for serving humanity and nation. Beside these thing universities educate them and through technical and professional degrees made them able to work for their better living standard.

It is also clear from the theory of economics that in many developed countries as well, there exist an inverse relationship between unemployment rate and higher education. More educated people have to face less unemployment as compare to those who will have less education. Economists observed that if workers become more educated stability of employment will also increase. There must be much lower rate of inflow in the unemployment rate among skilled workers if there is higher fixed cost. By evidence, in many developed countries many individuals face low level of unemployment are well established. (OECD 2000; ILO 1996). As the level of education increases according to many empirical studies (Nickel 1979; Mincer 1991; Woolbers 2000) the probability of unemployment decreases.

(Lavrinovicha, Lavrinenko et al. 2015) investigated that in recession of 2018, low skilled workers were affected more than high skilled workers. Employment rate of less educated people dropped by 11% while employment rate of highly educated people gained by 2%. According to authors even in developed countries like Italy, Greece and Portugal highly educated youth have to face more risk of unemployment as compare to less educated people.

In the case of Pakistan to find out the relationship between higher education and unemployment is the aim of this study. The main motivation there is no such empirical examining the relationship between these two variables and providing NEXUS of unemployment and higher education. Although much research explains the relationship between higher education and economic growth in the literature. According to Schomburg (2000) in Germany, relationship between higher education and unemployment states that growing problem of graduate unemployment the expansion of higher education was accompanied in that case. By considering the same problem, Woodley and Brennan (2000) explained that higher education and unemployment relationship in UK and according to results of their investigation, in early 1990s rapid increase in higher education led toward economic recession. An increase in unemployment of graduates and permanent decrease in employment.

There are strong effects of higher education in the economy, opportunities for employment, culture of the country and society. For the development of economic activity and growth, universities and colleges are observed as powerful engines. Mostly in developed countries role of higher education is observed as growth factor. In case of developing world generally, and particularly for Pakistan, for higher education last decades have been unsettled.

Because of significance changes in the economy, higher increase in returns of services sector and intense demographic shifts.

It is observed that with low level of unemployment higher education is associated. But particularly historically it is observed that individuals with higher level of education are associated with low level of unemployment. (OECD 2000; International Labor Organization 1996). For the lower frequency of unemployment among individuals, Nickell (1979) was the first to propose a theoretical framework. Generally it is seen that for the accumulation of human development which is associated with higher productivity level higher education played necessary role.to maintain high level of productivity firms will be reluctant to dismiss those employees with high skills. Signaling theory (Spense 1973) argues that the superior innate capabilities of graduates are being enhanced through education that is the reason that employers are keener to hire such workers.

Relationship of higher education and employment has been subject over the time. There has been intense huge debate on this subject. The issue has been whether the main function of education should be or is to prepare people directly to fit in job market and being employed or whether aim should be to provide students with opportunity for intellectual and personal development that could lead them for the improvement of their career (Williams 1985).

In most countries unemployment rate of youth is as least as twice as compared to total unemployment rate. This refers to the people who have freshly invested in human development that is why this phenomena is serious. Unemployment of youth discourage investment in education and raises the risk of being excluded from labor market which leads freshly graduates neither in employment or training.

While discussing about the history of higher education enrollment, most experts concluded that in late 1950s and mostly in 1960s for rappid economic growth higher education expansion was needed. Soon hope was developed that unemployment rate could be decreased through educational reforms. In early 1970s view about higher education enrollment was modified in order to meet growing diversity, career prospects and motives in students restricting higher education was common opinion of experts. During these years, optimism about higher education was replaced by criticism of higher education expansion which led to over education or over qualification. And this over qualification was blamed for mismatch or graduate unemployment. Same situation seems to be re-emerging today even in European countries.

Increasing number of graduates has been produced by expansion of higher education graduates without having the knowledge that how this supply of graduates and their skills match the demands of employment system (Teichler and Kehm 1995).

Underemployment and unemployment of graduates have devastating effects on the career and lives of graduates which this research proved. Reason behind this could be indicators of institutions or inefficiency or ineffectiveness of policies.in 2007 in the beginning of economic recession in US economy there were increasing number of highly qualified graduates, unable to find a permanent job in their chosen filed.in recent years unemployment rate of graduates has been higher than all past decades according to recent statistics.it is more difficult for them to find a in recent decade, from 2007-2008 one year after graduation, the unemployment rate of bachelor's degree recipients was 9%. A major reason behind graduate unemployment is mismatch between employment opportunities and skills of graduates.

There are many reasons and factors behind rapid increase in graduates unemployment which includes, increasing quantity of international graduates who are competitors and looking for an inadequate number of suitable jobs, the growing pressure on schools to increase access to education, schools not keeping their curriculums relevant to the job market, and students being constantly told that an academic degree is the only route to a secure future. There is a shortage of empirical evidence that education in developing countries affects growth of economy and poverty reduction. Several economists, including Milton Friedman, Gary Becker, and Jacob Mincer, After World War II, developed the "human capital" theory for individuals and society to examine the benefits of education on society. According to Friedman there was no evidence that 'social benefits' are yield by higher education. But benefits accrue over and above to the students themselves. Secondly it was hypothesized that may be political instability and social unrest promoted by higher education.

As higher education degree holders have to face more unemployment. According to panel study of income dynamics a major benefit of education is to lower the risk of unemployment .Data on labor force on the reduction incidence was collected and according analysis, it was concluded that it is important to notice that less duration of unemployment is generating educational differential in unemployment rates. indirect evidence has provided that more educated people face less unemployment as for more educated people cost on searching for new employment opportunity while employed on a lower position is less as compare to the cost for

searching employment opportunity while being unemployed. In obtaining job search information educated people are more efficient. To fill more skilled vacancies firms and workers search more intensively is also the reason.

With the passage of time society has begun to recognize that for better economic progress and living standard, investment in human development is also necessary. By investing in people it is possible to take advantage of technical progress as well as to continue further progress. Impacts of increased higher education expenditures has also been observed in current study. By providing subsidies and extra facilities to students could also lead them toward more higher education. After the formation of higher education commission in 2002, expenditures of higher education has been increased. An increase in rate of enrollment has been observed after 2002, so it is also taken in consideration what effects of expenditures on higher education.

To find out the nexus between unemployment and higher education, current study has taken two models. To check out impact of higher education on unemployment, in first model it has taken unemployment as dependent variable. In second model it has taken higher education enrollment as dependent variable to check out impact of unemployment rate. Some other variables as higher education expenditures, per capita GDP, sectorial share of GDP has also taken GDP growth rate and. To check the long run relationship among variables by checking stationarity of variables Johansen cointegration technique has been applied. According to results of Johansen cointegration technique there has been five cointegrating equation according to which there exist long run association among variables. Vector error correction technique has also been applied, in which short run and long analysis of variables has been done.

1.2 Research Objectives:

Following are the main objects of research:

- To explore the effects of higher education on unemployment in Pakistan.
- To evaluate the impact of highly qualified youth on higher education of Pakistan
- To suggest policy implications that how could we get the graduates absorbed in the labor market (Employment opportunities)

1.3 Research Questions

Following are the main questions of research:

- What is the relationship between higher education and unemployment in the case of Pakistan?
- How can we evaluate the impact of highly qualified youth on higher education of Pakistan?

1.4 Significance of the Study

Relationship of higher education and economic growth has been discussed in economic literature but this scenario is different here. According to pervious literature there exist positive relationship between higher education and unemployment. If there are more educated people in the economy probability that they will get a more suitable job. Because of more high education unemployment decreases. In current research will check the causality in the case of Pakistan between unemployment and higher education. Whether there is unemployment because of higher education or there is higher education because of unemployment in the case of Pakistan. This study will also investigate why there is no absorption capacity for graduates in the labor market and what are the reasons behind higher educated unemployment.

1.5 Structure of the study

In current study, existing literature reviewed in chapter 2, to determine the findings of previous studies about relationship of higher education and unemployment. all other factors which are responsible for educated unemployment. Chapter 3, has provided a historical background of unemployment and higher education. In chapter 4 study has discussed data and methodology for empirical analysis. Empirical outcomes of the analysis has been discussed in Chapter 5. In last chapter policy implications and conclusion of study has been explained.

Chapter 2 LITERATURE REVIEW

This chapter includes previous literature associated with unemployment and higher education. This research will review either in previous studies what was the causality between higher education and unemployment in different regions and different periods. A study is done by Erdem and Tugcu (1983) in Turkey, of cointegration and causality between higher education and unemployment, by covering the annual data from the period of 1960-2007 they investigated the relationship between these two variables.in search of common stochastic trends between variables, study used ARDL approach of cointegration. For the investigation of causal relationship Dolado and Lütkepohl's (2012) causality test is used. From the results of their analysis it has been observed that there exists a statistically significant common stochastic path between higher education and unemployment. In long run, according to the results, in case of Turkey one reason behind raise rate of unemployment is higher education graduates. Higher education in the short run also increases unemployment as well but its impact is low.

(Horner, Zhang et al. 2018) investigated the relationship of higher education on unemployment rate. By checking impact of higher education on unemployment rate, they have used data of six different variables including GDP per capita, higher education expenditures and share of manufacturing sector in GDP. Through simple regression technique and multiple regression technique they have estimated results by using data of 2015. They have concluded that there is inverse relationship between expenditures of higher education and rate of unemployment.

(Al-Manaseer and Al-Qudah 2018) investigated relationship of higher education output on unemployment rate in Jordan. Data from 2000-2016 has been taking by authors for estimation. To test hypothesis of the study, they have used simple linear regression model. According to conclusion of the study output of higher education had positive and significant impact on unemployment rate. By increase in higher education unemployment rate in Jordan will increase.

about the mismatch between output of higher education system in Jordan and Egypt and needs of labor market (Assaad, Badawy et al. 2016) investigated. According to their conclusion both factors from supply side and demand side could be responsible for mismatch in higher education and employment opportunities in labor market. Through a key factor variable of

institutional structure they concluded that higher education institutions produce more human capital, issues of supply side and institutional incentives have impact in absorption capacity of labor market.

On the labor market Causal impact of expansion of higher education has been analyzed in this study. Bu using population survey of 2005 variation across provinces and universities expansion, author found that expansion in higher education decrease unemployment rate in china. By using difference in difference model results has been estimated. But according to findings this unemployment rate has been decrease only in male graduates, female unemployment rate has not been decreased. Author analyzed that strong demand for skilled labor force is needed (Ou and Zhao 2016).

(Lavrinovicha, Lavrinenko et al. 2015) in case of Romania, studied the relationship between unemployment and higher education. To find out empirical evidence author has taken data of higher education graduates and used engel-granger causality analysis for the long run relationship examination. According to findings of the paper, there has been observed long term negative relationship between unemployment rate and higher education. According to conclusion of the study, higher education could be a proper approach to reduce unemployment rate.

(Hanapi and Nordin 2014) explored unemployment increasing rate in graduates of Malaysia. Qualitative research method was adopted to investigate problem. A questionnaire was designed to find out reasons of unemployment among graduates. According to conclusion of the study, factors which contribute to the unemployment problem includes quality of education and graduates attributes.

(Mirica 2014) identified whether there is long term association between unemployment rate and higher education in Romania. In order to examine the long run association among variables, Demand for higher education was quantified and Engel-Granger methodology was used. According to findings of the study, there has been observe long term negative association among variables. By increase in higher education unemployment rate will decrease and vice versa.

Walley (2014) in his research which was on Higher Education Expansion of China and Unemployment of College Graduates, investigated that expansion policy will cause a high unemployment rate for the youth after accounting for composition change in expansion policy for higher education. The Results have shown that the increase in the unemployment rate

associated with the expansion policy of higher education. It is also observed that educated unemployment is seen in some specific regions mostly.

(Zhang, Zhao et al. 2012) analyzed the higher education expansion and unemployment condition in China. Problem of policy implications and over education to address this issue has been discussed by this study. To alleviate the problem of over education authors has taken data from government documents and research findings. Experiences shows that employability crisis of graduates may need new reforms for higher education in order to address unique needs of every country. Author concluded that policy makers should seek alternative paths to reduce unemployment rate of graduates and for the development of higher education.

In Peshawar division of Pakistan reasons of unemployment among educated people are investigated by Mehmood et al (2011).He used primary data which was taken from 442 people who were resident of Peshawar and were capable for any professional job or at least graduation degree. It was conclude by using logistic regression study that woman are more unemployed as compare to man. Social structure of country is obstacle for women employment opportunities. The other reasons he found out for being the reasons of unemployment, he concluded that major factors of unemployment among educated people are high growth rate in population, shortage of resources and role of attitude toward getting high level jobs.

(Delaney and Doyle 2011) investigated the role of business cycles on appropriations of higher education. By using the data from 1969-1994 it has shown that income level has significant positive impact on higher education enrollment. In contradiction to this Humphreys (2004), Boylan (2010) investigated that, increase in enrollment rate has been related with budget deficits. When state wants to increase revenues, enrollment rate has been increased because educational institutions could generate revenues through fees. It has been reason for increased enrollment rate over the years.

Núñez and Livanos (2010) analyzed the effects of field of study and higher education on the likelihood of long-term and short term unemployment across Europe. They found a different result from existing studies. The authors state that unemployment is decreased by higher education and it has increased employment opportunities across Europe. Higher education could have positive or negative effects on the level of unemployment this study supports this argument.

Ahmad and Azim (2010) examined which was, Youth population and labor market of Pakistan, they have analyzed the participation of labor market of youth in Pakistan. To estimate the probabilities of being employed, Based on micro data of LFS (2006-07), Logistic Regression Analysis with maximum likelihood estimation was used to obtain the results, according to findings on the employment probabilities of youth in Pakistan age has significant impact. And the probability of being employed in the labor marke reducedas as an increase in level of education. Incidence unemployment among educated youth in Pakistan has supported by this study. Lack of skills and training among educated people in Pakistan is one the reasons of higher unemployment among educated people.

Livanos (2010) investigated in his paper to explore the labor market of young graduates in Greece used LFS micro-data. Secondary data from the labor force survey was also used. Employment situation of young graduates has assessed by using a logistic regression technique. According to findings, on the chances of employment the level of education does not appear to have a statistically significant impact. Conclusion was made through the fact that Individuals with high qualifications and unemployment situation leading toward the oversupply of graduates. This oversupply of graduates does not seem to match the demand.

(Tarvid 2010) worked on field of higher education and risks of unemployment, they have a look at how the shape of better training machine and labour marketplace rules have an effect on the chance of unemployment of an character with better training in 26 European countries. Particular interest is paid to the consequences of the country-degree traits at the labour market overall performance of graduates of various fields of observe. They observed that unemployment durations of at least 3 months and at the least one year. According to findings, country-degree signs have an effect on the employment potentialities of graduates of maximum fields move in equal direction.

(Mason, Williams et al. 2009) investigated on employability skills in higher education and their effects on labor market. According to their findings, they used specific facts amassed at college branch level, mixed with graduate survey data, to verify the effect of various styles of employability capabilities initiative on graduate labor marketplace performance. They discovered that dependent work revel in and company involvement in diploma route layout and delivery have clean effective results at the capacity of graduates to secure employment in ‘graduate-level’ jobs. However, a degree of departmental involvement in express coaching and evaluation of

employability capabilities isn't always drastically associated with labour marketplace performance.

The rate of return for MPhil and a Ph.D is investigated by Faheem (2008). According to his findings, job allocation depend both on supply of works and creation of job opportunities. Any job may not necessitate skills which worker may possess.

The relationship between unemployment and higher education by Plümper and Schneider (2007) was explored in Germany by using state-level data.it was concluded that higher education as a labor market instrument being misused against unemployment by state governments. According to Findings states have to face more unemployment rate in result of higher enrollment ratio in higher education. It has also seen that states have to experience largest decline in university spending per student as a result of relatively high unemployment. The severity of the unemployment problem this presents the most important case for their theory, caused by the degree of short-sightedness in German state governments.

Even with growing rate of knowledge and more educated people, and in continuous expansion of higher education with continuous demand for highly qualified people, an increased attention needed by economy and society on the relationship of higher education and employment. transition from university to work kind of opportunities should have provided (Salas-Velasco 2007).

(Salas-Velasco 2007) studied the world of work and relationship of higher education in case of European countries. Based on data set it has been analyzed that entry of young graduates in job market depends on different factors. For estimation of data set parametric models of duration has been used and estimated results has shown difference in north and south Europe. Graduates from UK and do not seem to have great problems in getting employment opportunities while graduates from Italy and Spain have to face problems in getting employment opportunities. Results has also shown that graduates who intensely search for job, they get a job sooner as in comparison of those who do not search frequently. There has shown gender biasness as well, mature graduates have to face more problems in getting job as compare to those who has done gradation recently. People also get jobs according to their professional degrees, in some professions demand for graduates is more as computing and architecture.

The educational system follows a variety of levels at school and college level Haq, et al. (2007). Participation of female graduates especially has risen during 2001- 2008 periods, with the rapid expansion at the higher education. Institutes and skills across the regions also risen heterogeneity. In case of Pakistan country has failed to produce a high demand for education shown by return to education has a declining trend. The labor market imperfections and imbalances have also risen with rising employment participation. Job opportunities are predominately reference-oriented rather than skill oriented that is why market is skewed toward influential people.

According to Bai (2006) mass higher education system has now established by China, through rapid expansion since 1999, judging by the net enrolment rate in higher education institutes. In this transition, Political and economic factors have been decisive and an increasing rate of graduate unemployment the achievement has been accompanied and problems associated to it. Increased number of university graduates were unable to absorb by China's labor market. The market demands were not adopted by old framework of China's higher education system. Nowadays the important role of higher education in well-being and economic growth has been well acknowledged and accepted by many nations. The higher education system failed to serve the national needs the inflation of qualifications can only lead to an increased rate of unemployed graduates.

Bloom *et al* (2006) investigated in their paper relationship of economics development and higher education in Africa. According to results higher education has little role in poverty alleviation in the economy of Africa. They have used a Cobb- Douglas production function where it has suggested that higher education is source of providing public and private benefits. As concerned for private benefits it includes better employment opportunities, greater ability to invest and sale and higher salaries. Improved quality of life would be result of private benefits

In case of Iran relationship between higher education and economic growth was investigated. For sustainable development and dealing with complexities inn future higher education play a vital role. Higher education institutes and universities educate people as responsible citizens which could fulfill needs of all sectors of humanity. Opportunities for higher learning could be provided throughout life. The advanced and create knowledge through research and provide their

services to the community. By using autoregressive distributed lag model, Author has used multivariable time series data on the variables. Relationship of long run and short run between variables was investigated. According to results it was indicated that higher education has long term and short term positive effect on employment opportunities and growth rate of the economy and in Iran.

In case of short-run existence, the education-job mismatch phenomenon may not certainly reject. But no one can save high level of unemployment in long run. McGuiness (2006).

Keep (2003), investigated the reasons account for the high levels of graduate unemployment. According to his study results it has suggested that the problem lies mainly in the orientation of the education system towards the public sector. It is observed that public sector is not growing it shrinking and educational institutions prepares employees for public sector as teachers, bank clerks etc. Public sector trying to reduce staffing level for administration. This is turning in to larger supply of these graduates and less demand which is resulting in high level of unemployment or underemployment.

Wolf (2003) examined, that it has been continuously rational decision for evolutionary nature of economic system the need of increasing educational spending. In order to remain competitive in global economy it is necessary for a nation to invest in skills that employers need in order to operate productive enterprises. Private and social returns in education investments were also discussed, private rate of return was more sufficient for making additional schooling beneficial for individuals. For the purpose of economic growth author suggested, concern with social rates of return in developing educational policy could be beneficial.

Wolf (2002) analyzed role of education and its potential impact of growth of economies. In her analysis author examined the role of enrolment rate in universities in both develop and developing countries. Potential growth rate has occurred in both develop and develop by increase in enrollment rate in universities. According to her conclusion although high enrollment rate in universities enhance growth process and increase potential growth. But it also true that as higher percentage of university attend university, risk for other for being left behind also increase. Although through research and other activities universities promote economic growth but author

suggests that creation of more educational institution and higher education enrollment will quicken the pace of growth rate.

(Woodley and Brennan 2000) analyzed monitoring and evaluation of graduates outcomes. According to their critical analysis, because of increase in types and number s of graduates over time it has been more complex. In order to make this simple they have taken full time first degree students for survey. According to their conclusion, employment opportunities for graduates not only base on higher education but other factors are also responsible. Cultural capital, background and schooling has been not taking into consideration while discussing about skills and capabilities.

(Chuang 1999) has examined reasons of unemployment in Taiwan through empirical evidence. He has taken data from youth employment status survey of 1984 and 1985. He has collected data both of currently employed people and those who were looking for job graduates. Personal characteristics and search variables are significant determinants of the duration for being unemployed of according to results shows that job search. . It has also suggested that job placement mechanism of government played important role in getting employment for graduates. Unemployment rate has increased if government does not provide proper mechanism for fresh graduate's employment.

(Benhabib and Spiegel 1994) estimated, by the use of physical and human capital stock's data and cross country estimation, author has regressed that by Cobb Douglas aggregate production function growth accounting regression is found. According to results, it was concluded that human development enters not significantly for the explanation of per capita growth rates. On a nation's human capital stock level depend Growth rate of total factor productivity depends. Human development has positive effects on economic growth.

Higher education effects on unemployment rate has been discussed by (Howe, 1993) according to him probability of being unemployed reduced by more education. Success in job market over time, an increasingly important criterion is higher education. In recent decades enrollment rate of university and college graduates has increased as there was an increase in demand of highly qualified people. In the period of rising educational attainment High school and universities graduates both were available for employers. So even when requirement of job

is not highly qualified people, employers tend to hire people with over qualification for the vacancy. The skill requirement for job vacancy and Skills possessed by high school graduates have not matched often. All these aspects had combined effect to generate a mismatch between number of job openings and people with universities degrees and number of these persons entering in market. Over all 66% unemployment among university graduates was increased in that time period because of all above reasons. Unemployment among college graduates was increased 15% in that era. As in comparison more highly qualified people had faced more unemployment in that era.

According to (Khan 1991) a shift in allocation of resources towards development of higher education points out several questions. As if these resources were well utilized and was that allocation economically justifies or not? According to analysis of study it was observed that estimation of social returns do not support the reallocation of public expenditures which could away from primary toward education. Due to low returns and high failure rate it was suggested that internal efficiency of the expenditures on higher education was low. Almost all public expenditures on higher education represented subsidy, and low income groups be gaining most from these educational subsidies. He concluded that quantitative impact of expenditures in higher education was low in case of Pakistan.

(Kodde 1988) examined in human capital theory framework the demand for education which was further prolonged with employment predictions which depend on the level of education. By using comparative statistics theoretical properties of the model were derived results differ from traditional human capital literature.by collecting data from Dutch high school graduates and fitting binomial logit model a substantial empirical support for theory was found. According to results people derive toward higher education for the improvements of employments opportunities not because of high rate of unemployment.

(Khan and Ali 1988) reported that below age of thirty, data from population census Pakistan shows educated unemployment. This educated unemployment has been absorption in labor market and problem of waiting for long time period. According to statistics of data, motivation of highly qualified people has not been career oriented and they has not perused realistic expectations. Khan and Ali (1986) investigated in case of highly educated people in Pakistan. According to the results of survey data about the situation of unemployed educated people, Primary and secondary data are used for analysis. OLS regression technique is used for

estimation, According to results the unemployment of the educated can be found on both the supply and demand sides. The demand side solution is a general one related to the strategy of growth. More specific and immediate solutions can, therefore, be sought on the supply side.

The argument of HCT, suggested that there is multifaceted relationship between higher education and unemployment. And it fails to explain, underutilization of rigidities and non-competitive labor market.

(Williams 1985) has investigated higher education as base for occupation. Theme of his study has been as in sense that people expect higher positions in job market after getting higher degree attainment. Over the time demand for higher education has also increased and students are more attracted toward education because of these incentives. For getting preference of employers, students chose subjects where they could get more satisfactory jobs, which has created mismatched between demand and supply of graduates in job market which is reason of increasing unemployment among highly qualified graduates.

In the labor market, determinants of unemployment investigated by quite a large number of economists like Clark and Summers (1982). Their results suggested that shortage of attractive jobs, frequent turnover and instability are major sources of teenage unemployment.

(Prasad 1979) investigated influence of several factors of highly qualified manpower on unemployment. Empirical analysis was done by using multiple regression and dummy variables. Sample was taken from 1971 special census on degree holders, author estimated duration of unemployment by fitting in unemployment function. According to results by giving a comparable length of exposure to education the unemployment duration could vary significantly. Unemployment time period could vary according to profession of educated manpower. But in each category unemployment duration is less among those with higher academic performance and females have to face more unemployment as compares to males.

Mook (1976) worked on the unemployment in developing countries which was carried out in Sri Lanka in 1976. Data come from long, loosely-structured interviews with approximately 450 former secondary school students. He concluded that real unemployment among educated young people is not as high as official figures often indicate and young people often do not (and/or cannot) make considered choices about their education and aspirations. Furthermore, they show a very low intensity in actual job-seeking. According to his statics, 64 percent of the girls and 54 percent of the boys felt generally positive about the content of what

they had learned. Only 22 percent of girls and 43 percent of boys said that they could not use their education in the market.

Concluded in research that education has direct impact on the level of unemployment. Unemployment rate for professional degree holders is as high as up to five times lesser unemployment for professional degree holders. According to EU statistics, there is much weaker relationship between higher education and unemployment. For decision making in higher education, this study could be used (Hwang 2017) as development of system based on the competence criterion, which is directly and indirectly logical to the factors effecting the unemployment levels and employment creation.

In the determination of national income or growth of national income, in theoretical and empirical literature education for workforce is important. By using school enrollment rate as proxy for educational attainment of workfare, results were concluded by using Cobb Douglas production function. According to results, growth of economy has been effected by education attainment. As in comparison of primary and secondary education, insignificant result to be found of primary education. While Psacharopoulos' results were different as in comparison with Barro and Salai, according to his results, tertiary education is more productive it does not matter either education is primary or secondary. These two studies had greatest difference between them, Barro and Salai covered great number of countries and dependent variable in their study was economic growth while in second study dependent variable was national income.

Over the past three decades unemployment has been cited as strong content economic growth measuring low employment rate in Ghana. The research suggested that low absorption capacity of labor market in Ghana and employment growth trail to economic growth. Demand factor effects on unemployment has also been shown in cross sectional estimation of probit regression model. Which represents a weak impact of employment generating on economic growth. Through empirical analysis it has also shown that susceptibility of urban tenants and youth to the rate of unemployment is some instances. Investment in agriculture and and manufacturing is suggested in policy recommendations which has employment elasticity of output. (Baah-Boateng 2013)

In recent years, unemployment rate for new college graduates in china has significantly increased. According to many economists, expansion policy of higher education is reason behind

this increased unemployment rate. This paper investigated through the use of three data sets which has been nationally represent.. results of expansion policy in long term, short term and medium term has been investigated of unemployed college graduates.by using a difference in difference strategy and using higher education as exogenous shock it has been concluded that expansion policy has increased short term unemployment in college graduates. But this affect only disappeared after five years and unemployment rate kept declining. Other effects also found to be reason of increased unemployment like gender and region..(Xing, Yang et al. 2018)

In South Africa rise in unemployment rate, since the transition of 1994.it is investigated in the paper that changes in labor demand and labor supply stagnant and unemployment rate peaked between 2001 and 2003. At the sectorial level between unemployed and employed, compositional changes extended the gap.is has conclude by using panel data which has been nationally representative, that unemployment is self-correct without any intervention of policy and it is nearly equilibrium level.(Banerjee, Galiani et al. 2008).

In the economy of china the higher education and policy making reforms, relating to the development of economy, unemployment graduates has specific causes. Study has also included historical and socio economic aspects for the understanding of china's movement to raise the level of higher education including emphasize on the unemployment level of graduates. The decision behind expansion of higher education policy and its impacts on society and on the employment of graduates particularly. China's mass movement towards higher education and its challenged has been discussed by Martin Trow's theory. After investigating, questions raised by report whether higher education should have expended on large scale or should it continue or not. Conclusion has taken that such large expansion of higher education sector has short term increased unemployment rate.

This paper inspects the study field and its long and short term impacts on unemployment level across Europe (EU15). For the investigation of study data used form Labour Force Survey (LFS), and for obtaining results half million individuals being used. Past problems of comparability across Europe has been solved by the consistent LFS classification of level of education and field of study. According to results of study, on reducing the likelihood of short term as compare to long term, academic degree has been more effective at a European level. (Núñez and Livanos 2010)

In case of Pakistan, development in socio economic sector and educational system in Pakistan not copying the right demand of labor market by importing the education in conversational subjects. Through political interferences, frequent educational policies have been suffered. curriculam is outdated and accumulation of human capital is draining when oly 2 percent of GDP has been spent on education Pasha (1995).

(Peterson 1976) examined in path breaking study, the impacts of variety of variables on higher education appropriations. According to results of the study, higher education appropriations has been positively related to personal income and enrollment rate.

Wages of labor and productivity has been fixed concerning jobs according to Human Capital Theory (HCT). Productivity of workers has not been effected by the level of education, over qualified workers have to accept same wages and job position on the basis of productivity. Schultz (1962) and Becker (1964).

2.1 Concluding Remarks

It has been observed that relationship of economic growth and higher education has discussed in literature. In the previous studies unfolds the fact that relationship between higher education and unemployment is positive if there are more educated people in the economy probability that they will get a more suitable job. Because of more high education unemployment decreases. Some of the researches argues that there is unemployment because of higher education and rise in higher education level because of increasing rate of unemployment. It could be observed from the findings of previous theoretical and empirical studies that the relationship between higher education and unemployment is still a debatable issue. Current research has checked in the case of Pakistan the relationship between unemployment and higher education. Whether there is unemployment because of higher education or there is higher education because of unemployment in the case of Pakistan. This study has also investigated whether there is weak absorption capacity in labor market and if so, why there is weak absorption capacity in the labor market for graduates and what has been the reasons behind higher educated unemployment.

Chapter 3

HISTORICAL TRENDS OF HIGHER EDUCATION AND UNEMPLOYMENT IN PAKISTAN

In economic development of any country, main and important role plays by higher education. To enhance the total productivity of level of economy, higher education provides help in development of human capital. As critical thinkers, scholars, researchers, innovators, entrepreneurs and responsible citizens to the societies are provided by higher education. New business and employment opportunities created by these individuals in the economy. Nations start investing in higher education because of its positive effects on the development of human resources. All graduates must be employed in order to get optimum benefits from produced skilled human development. But in many developing countries because of poor condition of labor market absorption capacity it is not easy for all graduates to get absorbed in the economy. Unfortunately graduates are becoming potential members of increasing unemployment rates.

In history of educational expenditures in Pakistan, it has been six decades, by the government of Pakistan education period has undergone. A very low investment as only 2 percent of total GDP has been spent on higher education till 2012.

Table 3.1 **Investment in higher education and rate of unemployment in pakistan**

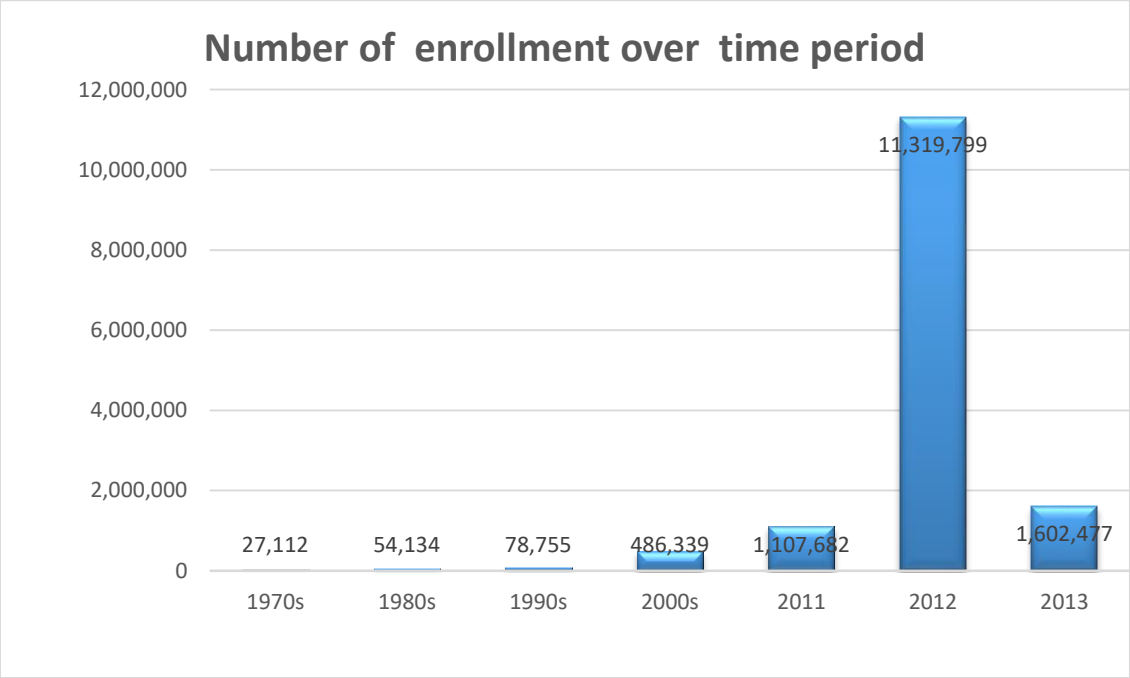
Time period	**Higher education (number of enrolment)**	**Unemployment % (No. of unemployed labor force)**
1970s	27,112	2.351
1980s	54,134	3.562
1990s	78,755	5.453
2000s	486,339	6.845
2011	1,107,682	5.950
2012	1,1319,799	5.950
2013	1,602,477	5.950

Source: Economic survey of Pakistan.

Past developments of higher education enrollment and unemployment has shown in above table 3.1 in Pakistan. Rate of enrollment in higher education continuously increasing in Pakistan Since 1970s. According to the average total number of enrollment in 1970s in higher education institutes per year was 27,112. In 1980s student's enrollment in higher education showed growth of 100 per cent as the enrollment in institutions of higher education as the average total number of students per year was 54,134. Annual rate of student growth enrollment had slowed down in 1990s as annual growth rate was just around 46 percent and average of total number of student's enrollment in institutions of higher education per year in 1990s was 78,755.

Up till 2002 in Pakistan, University Grant commission (UGC) was the only institution through which universities were recognized. There was only one institution on 14 august 1947 for higher education at the time of establishment of Pakistan. Among the forty colleges of four provinces, Punjab University expended. Establishment of university grant commission was led by this at the time of establishment of country. In 2002, with the name of higher education commission ordinance the governments introduces a new ordinance and since then, for any policy of higher education, degrees recognition, for the improvement in the standards of existing institutions, assurance of quality in education and developments of new institutions is responsibility of higher education Pakistan. By producing more PhD scholars about 9000 in last 10 years, leading role of Higher education commission could be recognized towards building a knowledge-based economy in Pakistan. Respectively PhD scholars has increased continuously. For the more expansion of higher education scholarship program of federal government has been established and more scholars are enrolled in higher education commission recognized institutions. HEC policies of expanding the higher education, they have sent 69 scholars to abroad in culture exchange program in 2007-2008. They have also sent 2600 scholars for overseas program in same year. During 2006-2007 period 366 more scholars with the collaboration of Cuban government has been sent for remedial studies.

Figure 3.1 **Number of enrollment over the time period**



Source: economic survey of Pakistan.

So that for the development and improvement of higher education decade of 2000 was an ideal era in Pakistan. Enrollment in higher education institutions was more than 500 percent from the prospective of average annual growth rate of students. The average of total number of student's enrollment in higher education institutions per year was 486,399 in 2000s. In three years from 2011 to 2013 higher education increased rapidly as annual number of enrollments were 1,107,682, 1,319,799 and 1,602,477. Number of public sector and private sector universities has been increasing since 2000.thereare various other causes of increase in level of education.

In case of Pakistan trend and movement of higher education has also been shown in table 3.1 above. Unemployment rate in Pakistan is high As in comparison with other developing countries. In Pakistan trend of unemployment shows increasing results. This unemployment trend which is increasing in nature has shown from last four decades. As from 1970s the average

unemployment rate was 2.351 percent of total labor force. A marked slowdown in economic activities owing the effects of external economic environment and domestic economic policies In 1970s has been witnessed. By the early 1970s the hope raised from inspiring performance of economy during the 1960s, was raised from discouraged experience of early 1970s. a major setback to economy was caused by the separation of eastern part of the country and disturbed political situation in 1971. A major element of uncertainty was added to the economy through the reforms which were introduced by government during 1972-77. Confidence of investors was shattered as nationalization of banking and life insurance, which were significant part of the industry and of entire financial system. Major sector of the economy, agriculture sector was also severely affected by adverse weather conditions in the first half of 1970s. The fivefold increase in oil prices along with 56.7 percent devaluation of currency in 1972 also played its role for slowing down economic activities as external factors.

In 1980s, unemployment rate of total labor force was increased by 50 percent. In this era average of unemployment rate was 3.5 percent of labor force. In this era enrollments of graduates and number of higher education institutions were increasing.

The worst period for the employment opportunities was the decade of 1990s.it was also not good for employment structure. Around 5.3 percent average annual unemployment rate was increased in Pakistan in the era of 1990s, of total labor force. From 1991 to 1995, witnessed a marked slowdown in economic activities. A significant slowdown in manufacturing sector was experienced. Several factors were responsible in league to constrain the growth in overall economic activities in general and manufacturing sector in specific. The reason behind this high rate of unemployment includes, bad law and order condition of the country, political uncertainty, emergence of infrastructure blockages in power, and insufficient industrial investment. Situation of unemployment rate was more worsen off in next five years, as labor force was estimated to be approximately one million higher than last year in 1994-1995.with the average raise in rate of unemployment rate it was more than doubled in next 35 years with an average of 2.5 percent agriculture sector used to employ 60.5 percent of work force and remained the largest employer of Pakistan work force. . In 1963-1964 its share of employment decreased gradually by 47.7 percent as Agriculture sector was the single largest contributor to GDP. In 1990s the share of agriculture sector in employment sector as well as share of agriculture decreased. Share of

mining sector and manufacturing sector also decreased as they were at their peak during the era of 1960s.These sectors fall from 13.6 percent from 1963 to 10.9 percent in 1994, as these two sectors were main in absorbing manpower. Employment in these sectors were matter of serious concern for policymakers for a country like Pakistan where labor is in surplus and major sectors declining in providing employment opportunities.

Over the time there was expansion in literacy ratios and improvement in physical infrastructure. The literacy ratios in 1998 were obtained 57 percent for male and 33 percent for female respectively.it was noted that during 1981 to 1998, female literacy had registered 100 percent growth in contrast to 60 percent for male. According to Pakistan economic survey enrollment rate also indicated a rise in 1998.in comparison between different levels of education it was observed that in 1990s enrollment in professional colleges registered the largest rise.Education facilities for students were expended over time as number of colleges for both male and female were risen substantially over the years. Number of colleges specifically for youth category were 711 in 1990, which were risen to 1000 in 1999. Same as number of female institutions went up from 230 to 301 during that time period.

3.1 Education and economic development in different political regimes

In different political regimes, investment in education sector and policies related to educational activities are discussed below.

3.1.1 Zulfiqar Ali Bhutto Regime

In political prospectus, after assuming power in 1971 the explanatory factor for the reversal of basic development model by Mr. Zulfiqar Ali Bhutto. In his regime many sectors were nationalized including all major banking sectors, manufacturing, insurance and education. For the next twenty years it caused a major disruption as confidence of private investor was declined. Negative impact on quality of education, expansion of exports and industrial development was felt after this socialism experiment. In economic making decisions overarching role to the bureaucracy was also given. As new culture was reinforced and bureaucratese were emerged as business leaders. Investors were also discouraged by the Problems of law and order, unreliable and inadequate infrastructure. For long term investments private investors were reluctant to invest in private sector. The breakdown of the East and West Pakistan also caused tremors in this period.

In regime of Bhutto, in 1972 new educational reforms were announced, according to reforms free education up to matric was in responsibilities of government. Under that scheme all educational institutes were nationalized and opened for students from all over the country despite of their social background and financial status. About 400 schools and several colleges were nationalized in that era and colleges were given a respectable position.

3.1.2 Zia ul Haq Regime

Most of the damage done by nationalization there was opportunity to undo it in period of Zia ul Haq. Practical measures were not taken by state owned and dominated economy to reverse the effects of last regimes. Although the technique of nationalization become out of control and preferential orientation in the direction of public region had been now no longer dwindled in anyway. The overall performance of financial system and economy turned into accurate on this regime not because of any political essential coverage reforms of institutional reforms. This regime changed into benefited from the investments which have been made in 1970s, and the maximum sizeable amongst them have been Tarbela Dam that delivered water availability and hydel electricity ability to fertilizers and cement factories. Imbalances in shape of big fiscal and current account deficits of the Nineteen Eighties had impact at the economic system in from of extended debt burden. Real development spending were increased by 3 percent per annum on the other hand real defense pending were increased by nine percent per annum on average during this period. The negligence of improvement spending changed into one of the purpose and contributory elements to gradual boom in 1990s. Primary goal of government of this era was to increase literacy rate. Policy was started with Islamic idea of literacy and education. The sixth plan contained a national policy in 1980s plan for 1984 to 1986. Literacy rate was 26.3 percent before, aim of educational plan was to raise it to 33 percent. For this purpose opening over 25000 literacy centers was proposed.in 1981, literacy rate of Pakistan was 34 percent even after setting bars low for literacy criteria. This rate had never made any substantial improvement from 1980 where according to census data literacy rate was 26.2 percent. Out of 160 countries in terms of literacy rate Pakistan was ranked at 142 in 1998. By governments own estimation, Pakistan had a population of 167,762,040 in 2008 with the literacy rate of only 49.9 percent. Even in 2015 Pakistan was ranked as second highest number of illiterate adults at 51 million. Enrollment ratios varies between provinces as enrollment ratio in Baluchistan was 32 percent in 1980s, in Sindh 59 percent, 52 percent inn Khyber Pakhtunkhwa and 48 percent in Punjab.

3.1.3 Nawaz Sharif Regime

Private investment and exports both tended to stagnate through the 1990s. Reforms of economic liberalization were introduced by the Nawaz Sharif Government in 1991. Access to capital was limited, Stability of macrocosmic variables was a serious issue and financial sector was controlled by ineffective state owned banks. Policy environment was inefficient and unstable In relation to rules, taxes and import tariffs. For the promotion of education in Punjab government of Nawaz Sharif allocated Rs. 4733.6 million in financial year 1985-86 for the education of girls. Government decided to establish 1250 additional primary schools for girls. Government also decided that it will further upgrade 500 primary schools to middle level and 256 middle schools to high schools. Government also decided to appoint 436 male and 136 female teachers for promotion of education. As 70 percent population of Punjab was in rural areas According to vision of government and 30 percent in urban areas. So according to division of population government decided to use more resources as 72 percent in rural areas and 28 percent in urban areas. Government of Nawaz Sharif allocated Rs.5820 million in financial year 1986-1987 for promoting education. According to minister of finance, government declared to establish 319 high schools, 483middle schools and 1250 primary schools. More than 2 percent budget was allocated for the financial year 1987-1988 for promotion of education by Nawaz's government in form of amount of Rs.5580 million. In financial year 1988-1989 government decide to allocate Rs.6191 million for promoting education in the country. With the support of federal government during this time period government took several initial steps for promoting education by using resources of province. In increasing rate of literacy rate and education level Federal and provincial government allocated resources and it played important role in increasing higher education ratio.

Table 3.2 **Allocation of funds and number of institutions**

Year	**Allocation of funds**	**Number of institutions**
1985-1986	Rs.4733.6 million	1250 primary schools for girls
1986-1987	Rs.5820 million	319 high schools,483 middle schools, 1250 primary schools

1987-1988	Rs.5580 million	
1988-1989	Rs.6191 million	

Source: economic survey of Pakistan 1990

Different employment opportunities were also provided to young educated people as 2,000 full time jobs and 150,000 on part time jobs opportunities were given to those who were educated. As Punjab was papules province of the country Major part of jobs was given to educated people of Punjab.

3.1.4 Pervez Musharraf Regime

Education is best way to protect a nation as comparison to other expensive ways to defend. There were 32 action plans and policies for education sector before Musharraf's regime, in sixty two years, sector introduced by governments but none came as savior. In era of Pervez Musharraf, he invested a great budget in educational sector for making visible changes in nation through educational reforms. In those days because of bad economic situation of Pakistan Education system of Pakistan was affected very badly in those days. Constitution of Pakistan announced, for removing illiteracy of Pakistan, that education at secondary level is obligatory. According to human development report, Pakistan was at the 136th place with 49.9 percent literacy rate.

Musharraf's reforms in educational sector were in form of establishing different new institutions. As nine engineering universities at the international level were established in era of Pervez Musharraf. The cost was over Rs 96.5 billion of renovating these universities. In the era of 1999-2000, there were 31 public universities which were increased to 49 public universities in 2005-2006. In the era of 2000, Air University and Institute of space and technology was established and four other universities were also established in the era of 2002 to 2005. In 2002 to 2005 in Pakistan rate of literacy was also increased form the level of 455 percent to 53 percent. Moreover 4 percent GDP was invested in educational sector and in this era, there was increased in number of institutions in this regime and total institutions were 99,319.in 1999, there were about 300 students who got the philosophy of doctorate degrees in Pakistan, while in era of Musharraf five thousand students got scholarships for foreign universities.

Higher education commission supervised higher education at all level, it was formed in era of Pervez Musharraf. This institutions with the status of independence and autonomous was

established in this era, the research programs were launched with the purpose of upgrading colleges and universities and getting higher education. In emerging the knowledge base economy, higher education commission plays a vital role since the few years in country, with increase in doctoral scholarships and with the program of foreign scholarships ever year.

As in comparison with last two decades, In 2000s situation for employment was little less bad, the average rate of unemployment was raised by slightly lower rate of 26 percent. In 2000s the average percentage rate of unemployment was 6.845 percent of total labor force as unemployment increased by 25 percent. From 2011 to 2013 employment situation was slight different as average percentage of unemployment raised by 5.950, stability could be because of improvement in infrastructure and employment opportunities.

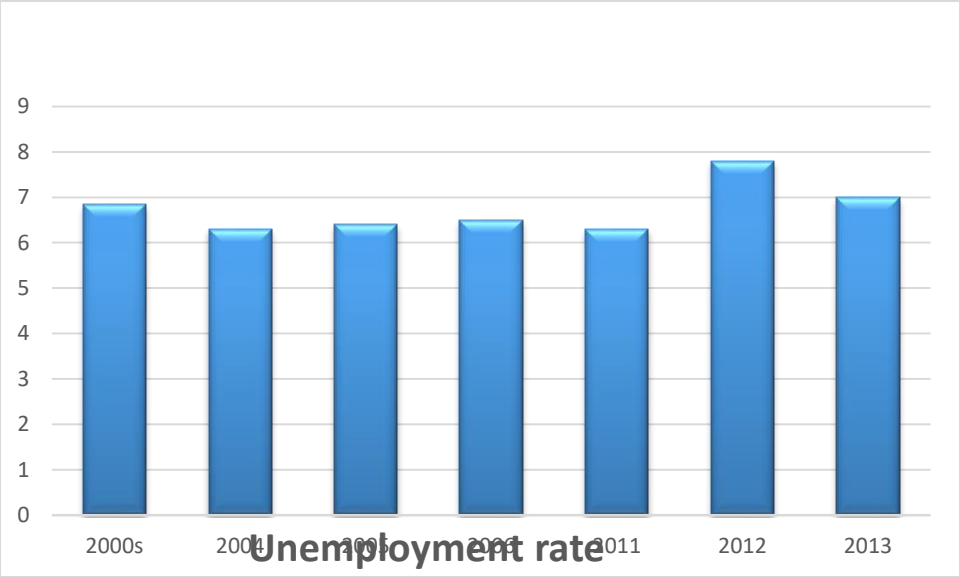
Table 3.3 **Unemployment rate in regime**

Year	Unemployment rate
2000s	6.8
2004	6.3
2005	6.4
2006	6.5
2011	6.3
2012	7.8
2013	7.0

Source: economic survey of Pakistan 2015

By observing unemployment rate from 2001 to 2006, it has come to known that unemployment rate was 6.3 per cent in 2011 and it went to 7.8 per cent in next year. Era of 2001 to 2006 was critical in case of unemployment as it was observed highest in these year where in 2004 it was at its peak where rate of unemployment was 6.3 percent which gradually came down in 2006 at the rate of 6.5 percent.

Figure 3.2 **Unemployment rate**



Source: Economic survey of Pakistan2015

During the fiscal year 2005-2007 as compared to last fiscal year 2004-2005, about 3.10 million people were unemployed as compared to 3.50 million in 2004-2005. Rising trend of unemployment started to decline from 2001. Unemployment rate for both male and female started to decline. According to age groups, rate of unemployment also vary as in 2005-2006, in age groups below 49 years unemployment rate also declined. Aggressive education movement of the government resulted in decline of unemployment in younger age group. Rise in enrollment rate decrease child labor. In 2006-2007 increase in public sector development program from Rs.272 billion to Rs.435 billion, which resulted in creation of a large number of jobs for young educated people in country. Setup of Pakistan poverty alleviating fund was set for providing micro financing loans in 2000 with endowment of $100 million. The aim of launched scheme was to provide opportunities of employment to young educated people between the age group of 18 to 40, having at least secondary school certificate. Pakistan poverty relief fund scheme is found in 104 districts of the country and it has sixty eight accomplice organizations.

3.1.5 Asif Ali Zardari Regime

From 2008 to 2013, during economic recession and recovery the change in magnitude of unemployment rate varied as according to educational attainment. Individuals which were having

bachelor's degree have to face less unemployment as compare to those who were not even high schools completers. for the age group of 20 to 24 at every level of educational accomplishment unemployment rate from males and females generally increased from the year 2008 to 2010. As comparison of males and females, the males who have not completed high school there was 14.3 percentage point increase in level of unemployment and the males which were completers of high school, their unemployment rate was 4.7 to 9.8 which was 5.1 percentage point higher than males with bachelor's degrees. As examine to ladies who were having as a minimum bachelor's diploma unemployment did not change during the years 2008 to 2010. But the rate of unemployment of female young adults who were having college education improved from 6.5 to 12.1 percent and unemployment rate increased from 12.5 to 19.9 percent for those who were not having college degree. Economy was recovering from economic recession from 2010 to 2013, rates of unemployment did not change according to educational attainment levels either for males or females. From 2010 to 2013 unemployment rate for high school completers was lesser.in 2013 unemployment rate of both males and females, which had completed high school education, was high as compare to 2010. However unemployment rate for males and females adults with bachelors or higher degree was not measurably different from the year of 2008. Further unemployment rate of female young adults who had completed high school education, was not much measurably from the unemployment rate of 2008. During 2013-2014 at the end of the era of Asif ali zardari,s government, there were 77.6 thousand teachers in private and public sector and 161 universities in the government of Asif ali zardari. During same years enrollment rate of students in universities during the same years remained stable at 1.60 million. Rate of enrollment was estimated to be increased by 12.5 percent, from 1.6 million to 1.8 million. Overall situation of education, on the bases of key indicators of enrollment rate, number of teachers and institutions, showed a slight improvement. The total number of enrollments in 2012-2013 was recorded as 411.11 million which was increased to 42.1 million in 2013-2014.However number of institutions showed a slight decline from 240.9 thousand during 2013-2014and 241.5 thousand during 2012-2013, however number of institution were predictable to increase to 244.9 thousand during the year 2014-15. The number of teachers also declined in 2013-14 from 1.55 million during year 2012-13 to 1.53 million in comparison. It was estimated by government to increase this number of teachers to 1.57 million in 2014-15. Expenditure on education sector was increased gradually since 2006-2007 as 12.03 percent rise on related to

education expenditures was noted. It was Rs.537.60 billion in 2013-2014 and Rs.479.85 billion in 2012-2013. An amount of Rs.3.45 billion was provided For on going and new projects of ministry of federal education. From Cuban Medical University, 537 Pakistani doctors graduated under the project 1000 Cuban Medical Scholarship program in February 2015.

3.1.6 Nawaz Sharif Regime 2013-2017

From the regime of 2013 to 2017, in educational sector Nawaz Sharif government was establishing new public universities, improving relation with foreign universities as well as upgrading private universities. Higher education commission also initiated various Ph.D. and other scholarships programs for enhancement of quality of education in Pakistan. UNESCO target was to increase educational budget by 4% of GDP by 2018 from 2.6 % allocation of budget for education, government committed to increase budget allocation. For achieving 80% enrollment up to middle level and 80% enrollment for universal literacy government was working on initiating a legislation for providing roadmap. Government planned to reform and upgrade existing educational institutions. Setting up of Danish schools in Punjab and several institutions of education and provision of funds. Scholarships were provided to needy and poor students for higher education and to bring a revolution in educational sector of country. Government of Nawaz Sharif provided more than Rs 820 million for the provision and facilities in educational sector. Infrastructure for schools and colleges was being provided. In era of Nawaz Sharif, US Pakistan knowledge corridor was established. According to this program nineteen existing university partnership between US and Pakistani institutions. Fulbright scholarship program was given by government of Nawaz Sharif three university centers for advanced rsearced in agriculture, energy and water research in the time period of Nawas sharif foreign scholarship program was started for MPhil/MS leading to PhD for 1500 students. Faculty development program was also started in this era. In 2014-15 Rs.43.00 billion were allocated by the government with exceptional grant of Rs.1.50 billion for the development of less developed areas. During 2014-2015 86.6 percent or recurring budget was assigned to universities/ institutions. For the promotion of research and academic activities through national programs for universities. about 12.2 percent of the recurring budget was allocated to universities. There were 163 universities, during 2015-2016 with 83,375 teachers in both public and private sector. Overall enrollment of students in higher education was 1,355,694 in contrast to 1,299,160 over 2014-15, an increase in enrollment of 4.6 percent. Enrollment rate was expected to increase and

to be 1,287,923 as overall education condition base on key indicators of enrollment, number of institutions and teachers, and these indicators were improved slightly. Total number of enrollments increased from 43.948 million in 2014-15 to 46.223 million in 2015-2016. It shows increase of 5.2 percent and it was predictable to rise to 47.834 million during 2016-17. Total number of institutions were 252.8 thousand during 2015-2016 and 252.6 thousand in 2015-16 which were predictable to rise 257.1 thousand during 2016-2017. Total number of teachers during 2014-15 were 1.588 million and 1.630 million in 2015-16 which showed an increase. Expenditures on education as percentage to GDP was 2.2 percentage of GDP in fiscal year2015 and 2.3 percentage of GDP in fiscal year 2016. Expenditures on education increased by 10.74 percent to Rs.599.05 billion in fiscal year 2015.In order to achieve 4.0 percent of expenditiure of government of Pakistan tend to increase resources3 towards educational sector.

3.2 The reasons of unemployment in Pakistan over the years

One of the major problems of Pakistan is unemployment and level of unemployment is moving up day by day. Following are the reasons of increase in unemployment rate.

3.2.1 Slow expansion rate of industrial sector

The expansion rate of industrial sector is very slow and increasing labor force is able to absorb in labor market fully. Four major causes are behind industrial slowdown. Economic reforms program initiated in 1990s As a result of it, reduction in production was there, the key element was to make more open economy through these reforms and low tariff. Average tariff which was 80 percent was reduced to 20 percent after that. It is considered as a cause of industrial slow down since then. In industrial sector Low labor productivity combined with higher cost of manufacturing also considered as cause of slow industrial expansion. In many industries, raw material determined the cost of production and other factors including productivity and structure of labor and rate of interest. Performance of these all elements is not progressive and productivity is decreasing in case of economy of Pakistan. Because of economic policies Demand for industrial products is weaker, through a contractionary fiscal policy and tight monetary policy for reducing current account deficit to pursue the IMF supported stabilization program since 1988, it has been economic policy. These policies also include cuts in development expenditures, regular increase in charges of utility and exclusion of subsidies. Which is not only responsible for creating direct increase in unemployment but also decrease in demand of industrial goods and purchasing power with increase in poverty. Reduction of fiscal

deficit deserves higher priority and elimination or decrease in subsidies, but a more slow reduce can allow more fiscal space when deficit have brought down to a sustainable level for economy, which could be helpful foe expansion of development of public sector and social sector spending. By increasing purchasing power of consumers, demand for industrial products could be raised as it the only suitable way for ensuring that benefits reform reach the poor and employment reforms reach the unemployed. Confidence of investor is declining over the years because of many economic and non-economic factors, and in different sectors as overall investment has fallen from 20 percent of GDP to less than 14 percent 2002. For improving industrial structure, investors' confidence need to be revived by providing good facilities and good economic and non-economic environment.

3.2.2 Increase in general output

Number of educational institutions is increasing day by day which is also increasing general output and that is the major cause of educated young generation's unemployment. People are moving toward more higher education for the sake of getting more employment opportunities, but it is creating more supply of graduates in the economy in form of general increase in output level of educational institutions which is not an easy task for the developing economy to absorb.

3.2.3 Unskilled labor

Skilled labor is less as technical, professional and vocational institutions are limited in numbers. Institutions focus on degrees rather than focusing on skills of students which creates problem of mismatch between job requirements and skills of employs. This lack of skills further increase problem of decrease in output and do effect productivity level of labor. According to a study done by state bank, productivity of Pakistan's labor force in past decades showed a growth of 20 percent which is lowest in region. Between 1998 and 2018 due to limited access to education and lack of skill developing and vocational training programs country lost its human capital potential.

3.2.4 Privatization of industrial sector

Employment in private sector is poor, privatization of industrial sector has effected investment which further lead to unemployment and less employment opportunities in private sector. Privatization has economic value though it also has social consequences. For reducing fiscal deficits and private sector debt government of Pakistan embarked on a program of privatization of industries. According to government expectations privatizations of industries will enhance productivity by increasing efficiency in all economic sectors and invoking technical competence of private sector. But it has not worked according to expectations, it has not contributed in

improvement of efficiency, competitiveness and profitability of industries. The main objectives of tax reforms, debt reduction and poverty alleviation and protection of workers interest were not part of policy given for privatization. As a result, without improving the necessarily quality of products and reducing the effective protection, privatization leads to declining of employment. As most of privatization was taken place at the time when economy was at deteriorating point, there was lack of alternative employment opportunities which led to increasing level of unemployment.

3.4.5 Constant growth in population

A major reason of unemployment is the constant highest increase in population as resources of country are restricted and population has increased its optimal level. According to National human development report of United Nations development programs, to match the need of people in Pakistan and constant increase in people who are reaching to the age of work proper growth in employment opportunities is necessary. It was clearly indicated according to employment situations, labor force participation and unemployment rates in Pakistan that indicates that in every five years around 1.4 million or even more will be joining labor force. Whereas around 3.5 million people are not employed. Over every five years Pakistan need to create to employment opportunities for 4.5 million people At that rate number of those who are retiring and number of labor force participation. It was also suggested in the report that labor market has been under more pressure because of demand for more employment opportunities and rapid increase in labor force participation.

3.2.6 Elderly labor force participation and youth unemployment

Retired people are willing to provide their services at their some other places at lower wages which blocks the employment opportunities for young educated people. Curious fact about retirement that many people reverse their decision and run to work. There could be many reasons where main could be economic shocks and indeed return rate on many financial assets are uncertain, people tend to have a permanent source of income, health care expenses may increase unexpectedly and no one knows or could predict health span. Information shocks and regret of not saving enough for lifetime could also be reason of again joining work force. High rank civil and military people move toward reemployment in government agencies and corporations which is the reason of deprives the qualified young people.

3.2.7 Law and order conditions

Because of bad law and order conditions, continuous unrest and violence, investors are reluctant to invest in country which has slow down the tempo of economic activities. It is a universal truth that economies always follow politics and politics remains the result of prevailed law and order condition in the country. If condition of law and order will run smoothly, it will lead to a stable economy of the country indirectly from smooth economic conditions. Unfortunately in Pakistan law an order condition is not good that is the reason which leads toward less investment and more unemployment. Law and order condition rise when there is threat of violence arising due to many other factors and insecurities.

3.2.8 Young people averse to entrepreneurship

Young educated people only want to get white collar jobs, they are not intended to get self-sustained business. Their attitude towards carrier choices is not realistic and productive. Orientation toward entrepreneurship is one the main element of growth for an economy, it defines ability of a nation to generate wealth, create more job opportunities, produce goods and services and transform knowledge into ideas and commercial activities. But unfortunately Pakistan is one of the lowest ranked countries in the term of entrepreneurial activities. The reason behind this scenario is country's socio economic outlook. People only prefer jobs in multinational companies, international developing agencies and public sector. Success in entrepreneurship and business depends on innovation capability and policy environment and unfortunately Pakistan is not performing well in both fields.

3.2.9 Demand and supply imbalance

A number of people start studying a particular field if there is boom there, so at the end there is more supply of people against the demand for specific vacancies.

Chapter 4 METHODOLOGY AND MODEL DESCRIPTION

In order to untangle the effect of higher education empirically, the study used a difference-in-difference strategy which is actually a statistical technique which is used in econometrics to mimic an experimental research design. This study applies a difference-in-difference strategy by estimating the following Linear Probability Model (LPM). To explain the causality between unemployment and higher education this research considers two separate models.

4.1 Model 1 Factors affecting the Unemployment

$$UN = \alpha + \beta_1 HEE + \beta_2 HE_X + \beta_3 GDP_{PC} + \beta_4 GDP_g + \beta_5 GDP_{agr} + \beta_6 GDP_{manu} + \beta_7 GDP_{ser} + \varepsilon \quad \text{..... Eq. (4.1)}$$

Following abbreviations of variables has been used for estimation:

UN= unemployment rate

HEE enrollment of students in higher education, it includes all masters, Mphil and Phd graduates.

HE_X= expense on higher education/ expenditures for higher education.

GDP_{PC}= per capita GDP.

GDP_g= GDP growth rate.

GDP_{agr}= share of agriculture sector in GDP.

GDP_{manu}= share of manufacturing/industrial sector in GDP.

GDP_{ser}= share of services sector in GDP.

ε is an error term.

4.2 Model 2 Factors affecting the Higher Education

$$HEE = \alpha + \beta_1 UE + \beta_2 HE_X + \beta_3 GDP_{PC} + \beta_4 GDP_g + \beta_5 GDP_{agr} + \beta_6 GDP_{manu} + \beta_7 GDP_{ser} + \varepsilon \quad \text{Eq. (4.2)}$$

Following abbreviations of variables has been used for estimation:

UN= unemployment rate

HEE enrollment of students in higher education, it includes all masters, Mphil and Phd graduates.

HE_X= expense on higher education/ expenditures for higher education.

GDP_{PC}= per capita GDP.

GDP_g= GDP growth rate.

GDP_{agr}= share of agriculture sector in GDP.

GDP_{manu}= share of manufacturing/industrial sector in GDP.

GDP_{ser}= share of services sector in GDP.

ε is an error term.

In equation (1) unemployment has been taken as dependent variable, β_1 represents higher education enrollment, β_2 has represented expenditures on higher education, β_3 represented GDP per capita and β_4 represented growth rate of GDP. β_5 , β_6 and β_7 has represented sectorial share of GDP respectively. In equation (2), higher education enrollment has been taken as dependent variable.

4.3 Data collection and Description of variables

Data of unemployment rate, share of GDP in service sector, share of GDP in agriculture sector, share of GDP in manufacturing sector, GDP growth rate, GDP per capita and GDP has been taken from world development index. Data of higher education enrollment is taken from Pakistan economic survey. United Nations educational, scientific and cultural organization has

been source of data for the variable of higher education expenditures. Data has been collected from 1985 to 2018.

Higher education enrollment rate is the quantity of students which has been enrolled in higher education during this specific time period. Higher education expenditures is the proportion of GDP which has been specifically given for expansion and facilitation in higher education. In comparison with early time period, rate of change in the percentage value of all good in services produced in a country with a specific time period is known as Economic growth rate. It is observed that change in gross domestic product of a nation is measured by economic growth rate. Economic output of a country is measured by GDP per capita that accounts for its number of people. For measuring the standard of living of a country, gross domestic product of country is divided by its total population. Sectorial share is share of three major sectors of economy for overall GDP.

There are some other terms which are frequently used in analysis and not included as variables, as following:

4.4 Number of higher education institutions

Where people of different ages goes to gain education is known as institutions of education. Including all type of institutions as primary, secondary and higher education, variety of these institutions can be public, private or unconventional. Here number of education institutions represents all higher educational institutions where degrees in different disciplines are provided to students.

4.5 Number of enrollments

Number of enrollments means properly registered total number of students attending classes at a school or in an institutions. There is positive relationship between number of enrollments and higher education, if number of enrollments will increase higher education will also increase but if number of enrollments in educational institutions will decrease higher education will also decrease.

4.6 Number of graduates

A graduate is someone who has received a degree from a college, university or educational institution. In current research number of graduates are positively related with higher education, if number of graduates will increase there will be increase in higher education if number of graduates will decrease higher education level will be decrease.

4.7 Stationary issue and unit root test

For the estimation of empirical analysis, unit root test has been applied to check stationarity of variables. Study will apply estimation technique according to stationarity of variables, if all variables became stationary at first difference, Johansen Co-integration method would be applied. If some variables became stationary at first difference and some became stationary at second difference auto regressive distributive lag distribution method would be applied.

The approach to unit root testing implicitly assumes that the time series to be tested$yt = D_t + z_t + e_t$ (4.3)

D_t is seasonal component or trend.,z_t is stochastic component and $e_t$is stationary error process.

4.8 Estimation technique

Statistical expression of equilibrium relationships nature with cointegrated variables, sharing common stochastic trends are viewed as cointegration. To evaluate co-movement of long term variables cointegration analysis can be used. It establishes a long term relationship between variables by calculating long run equilibrium and correlations within an error correction model estimated. That is the reason that stochastic trends to the respective time series are found prior to the cointegration analysis. If there is any cointegration vector it will be indicated by cointegration analysis, study infer that the tested theories will not drift apart in the long run and they will revert toward equilibrium levels following any short term drift that may take place.

In early 1980s Engle and Granger introduced cointegration analysis, with additions and improvements made in subsequent years. It is a modeling process which incorporates non stationary with both short term relationship and long term analysis. To examine data of time series by using coinegration, time series should be non-stationary in its level form and integrated of order 1, written as I(1). By integrated of order 1 means that series has become stationary after differentiating it once. If variables are stationary of order 1, they are said to be cointegrated and have linear combination. Cointegration technique is underlying methodology this study used for analyzing the relationship between higher education and unemployment in case of Pakistan. It

allows to identify co movements between variables where if cointegration exists. Cointegration is recognized as an acceptable method for analyzing co movements of variables.

Two cointegartion methods have been used consistently throughout the different studies which are:

4.8.1 Estimation Technique No 1:Engle-Grangers two step estimation method

This technique required two steps methods for estimation.

First estimate the original model,

$$Y_t = \beta_0 + \beta_1 X_t + \mu_t \quad \text{..... (4.5)}$$

By obtaining the residuals from equation 1

$$\hat{\mu}_t = Y_t - \hat{\beta}_0 - \hat{\beta}_1 x_t \quad \text{..... (4.6)}$$

$$\Delta\hat{\mu}_t = \alpha_1 \hat{\mu}_{t-1} + e_t \quad \text{..... (4.7)}$$

Because of reasons mainly shortfall of engle-granger two step estimation method,This study used Johansen,s method. Engle-Granger two step estimation method is very easy to run, however a large sample size is required to avoid possible estimation errors and secondly it could only be run on maximum two variables. Many drawbacks also includes that it also doesn't allow for hypothesis testing on co integration relationships. This study worked on more than two variables, for examining multivariate framework johansen co integration better suits the data due to the fact that it can examine more than two variables and treat all variables as endogenous which Engle-Granger technique could not examine.

4.8.2 Estimation Technique No 2: Johansen's maximum likelihood method

According to (Coen, Gomme et al. 1969) for some years it is into awareness of econometricians that economic system critically depend on cause and effect of lag between variables. It has also been observed that stability of economic system may depend on the length of time taken for a stimulus to pass through the temporary to full response. In 1966, Gomme approached in first place a critical appraisal for the concept of lag which predicts economic events. After two years of his investigation he had some success in development of basic equation which predicted real crisis in time.(Nerlove 1972) discussed the idea of more general theory of rational expectations which is also called forecast or conditional expectations theory. On the basis of all observations

and relate to variables up to time of forecast this theory is based. Rational expectations can also be forecast when variables which are being forecast are endogenous to the model.

4.8.3 Granger causality test

On a criterion of incremen- tal forecasting value the notion of Granger causality is based. A variable X is said to "Granger cause" another variable YX if "Y can be better predicted from the past of X. and Y to- gether than the past of Y alone, other relevant information being used in the prediction" (Pierce, 1977b).

4.9 Johansen's Cointegration Method

For the study after completion of unit root test analysis of time series data, as all series are integrated of first order. After assuming all our time series are integrating at first difference and completion of unit root testing on our time series, Johansen co integration test, method which is used for testing co integration for number of time series variables named after Soren Johansen. it is not essential and not always the case but Most appropriate case is when variables are integrated of order one, however, johansen co integration could be applied even in case when some variables are integrated at I(0) some at I(1) and I(2). But for best results of time series variables they should be co integrated at I(1). Process of co integration is carried out by vector auto correction model of order p given by:

$$\boldsymbol{Y_t = u + A1_{yt-1} + \cdots + Ap_{yt-p} + \varepsilon_t} \quad \textbf{.....Eq(4.8)}$$

In above equation $\boldsymbol{Y_t}$ represents n*1 vector of variables which are supposed to be the integrated at order 1, which are commonly denoted by I(1). $\boldsymbol{\varepsilon_t}$ is n*1 vector of revolutions.

The above model can also be represented in following form:

$$\Delta \boldsymbol{y_{t=}}\mu + \boldsymbol{\pi y_{t-1}} + \sum_{i=1}^{p-1} \boldsymbol{r_i}\, \Delta \boldsymbol{y_{t-1}} + \boldsymbol{\varepsilon t} \quad \textbf{..... (4.9)}$$

$$\textbf{Where } \boldsymbol{\pi} = \sum_{i=1}^{p} \boldsymbol{A_i}\textbf{-1 and } \boldsymbol{r} = -\sum_{j=i+1}^{p} \boldsymbol{A_j}$$

If the coefficients of matrix π has reduced rank r<n then there exist n*r matrices α and β each with rank r such that π=αβ' and β'$y_t$is stationary. And r is the number of co integrating relationships. Elements of α are known as the adjustment parameters in the vector error correction model. and each β is co integrating vector. Here it can be shown that for a given r the maximum likelihood estimator of given β defines the combination of y_{t-1} that yields the r

largest canonical correlations of $\Delta \boldsymbol{yt}$ with y_{t-1} after correcting for lagged differences deterministic variables when present. Two different likelihood tests were proposed by johansen for the significance of canonical correlations. Which were the following:

1. The trace test

2. The maximum eigenvalue test

$j_{trace} = -T \sum_{i=r+1}^{n} ln(1 - \hat{a}_i)$…… (4.10)

$j_{max} = -Tln(1 - \hat{a}_{i+1})$…….. (4.11)

Now in the above equations, T is the sample size and $\hat{a}_i$ is the ith largest canonical correlation. The trace test, tests the null hypothesis of r co integrating vectors against the alternative hypothesis of n co integrating vectors. On the other hand the maximum eigenvalue test, tests the null hypothesis of r co integrating vectors against the alternative hypothesis of r+1 co integrating vectors.

In the above equation, δ shows the number of co integration relatinships. Where α and β are said to be adjustment parameters in vector error correction model. It is important to discuss that with any givenδ, shows the combination of yt-1 captures δ with largest canonical correlations of Δyt with yt-1 when it's checked and corrected for lagged differences and deterministic variable if present. In the procedure of johansen co integration technique, there are two likelihood ratio tests of significance which are followed. Those tests are named as trace test and maximum eighen value test.

4.9.1 Test for cointegration: trace test

$H0$: rank (π) =m, H1: rank (π) >m

Rank (π) =m = r cointegrating vectors, if m=0, rank=0 which means no co integration vector.

Rank (π) >m = n cointegrating vectors, if m>0, rank>1 which means there is at least one co integration vector.

Likelihood ratio statistics for trace test is as following:

$LKt(m) = -T \sum_{i=r+1}^{n} ln(1 - \hat{a}_i)$…….... (4.12)

In first case of trace test, there are r co integrating vectors according to null hypothesis while there are n co integrating vectors according alternative hypothesis. $LK_t(m)$ takes larger values which means that H0 is rejected, and sum of remaining values is larges which are $\gamma_{m+1} \geq \gamma_{m+2} \geq \gamma_{m+3} \ldots\ldots \geq \gamma_{m+k}$.

If γ is large it means that $ln(1 - \hat{a}_i)$ is large and vice versa.

In second case, maximum eighen value test, there are r co integrating vectors according to null hypothesis while there are r+1 co integrating vectors according alternative hypothesis. Critical values for both tests could be observed in the tables.

4.9.2 Test for cointegration: maximum eighen value test

$H0$: rank (π) =r, H1: rank (π) r+1

$$LKmax(m) = -Tln(1 - \hat{a}_{i+1})$$

If m=0 there is no cointegration and if m=1 there is cointegration.

4.9.3 Empirical models for johansen cointegation

From equation (3), the general equation of johansen cointegration technique, model (1) and (2) has been fitted as follows.

Model (1):

$$HE_t = \alpha + \beta_1 UE_{(t-1)} + \beta_2 GDPpc_{(t-1)} + \beta_3 GDPg_{(t-1)} + \beta_4 HEx_{(t-1)} + \beta_5 GDPagr_{(t-1)} + \beta_6 GDPser_{(t-1)} + \beta_7 GDPmanu_{(t-1)} + \varepsilon t_1 \ldots\ldots (4.13)$$

Model (2):

$$UE_t = \alpha + \beta_1 HE_{(t-1)} + \beta_2 GDPpc_{(t-1)} + \beta_3 GDPg_{(t-1)} + \beta_4 HEx_{(t-1)} + \beta_5 GDPagr_{(t-1)} + \beta_6 GDPser_{(t-1)} + \beta_7 GDPmanu_{(t-1)} + \varepsilon t_1 \ldots\ldots (4.14)$$

Two empirical modes has been made to check causality between two variables.

4.10 Vector error correction model

Higher education is dependent variable in model (1) which is represented by equation (4.15). Unemployment rate, gdp per capita, gdp growth rate, higher education expenditure and sectorial

share of GDP and error term respectively. Following equations discussed below are taken from johansen cointegration.

$$HE_t = \alpha + \beta_1 UE_{(t-1)} + \beta_2 GDPpc_{(t-1)} + \beta_3 GDPg_{(t-1)} + \beta_4 HEx_{(t-1)} + \beta_5 GDPagr_{(t-1)} + \beta_6 GDPser_{(t-1)} + \beta_7 GDPmanu_{(t-1)} + \varepsilon t_1 \quad \text{..................} (4.15)$$

Equation (5.1) is error correction term for unemployment rate. By omitting all other variables from main equation and taking variable of unemployment error correction equation has been made.

$$HE_t = \alpha + \beta_1 UE_{(t-1)} + \varepsilon t_1 \quad \text{..................} (4.16)$$

$$\varepsilon t_1 = HE_t - \alpha - \beta_1 UE_{(t-1)} \quad \text{..................} (4.17)$$

Same as equation (5.1), only variable is change, now error correction equation for GDP_{pc} has been developed.

$$HE_t = \alpha + \beta_2 GDPpc_{(t-1)} + \varepsilon t_1 \quad \text{..................} (4.18)$$

$$\varepsilon t_1 = HE_t - \alpha - \beta_2 GDPpc_{(t-1)} \quad \text{..................} (4.19)$$

To estimate the adjustment of GDP_g in higher education enrollment, error correction equation has been developed as (5.3).

$$HE_t = \alpha + \beta_3 GDPg_{(t-1)} + \varepsilon t_1 \quad \text{..................} (4.20)$$

$$\varepsilon t_1 = HE_t - \alpha - \beta_3 GDPg_{(t-1)} \quad \text{..................} (4.21)$$

In first model, to find adjustment of higher education expenditures in higher education error correction is formed as (5.4).

$$HE_t = \alpha + \beta_4 HEx_{(t-1)} + \varepsilon t_1 \quad \text{..................} (4.22)$$

$$\varepsilon t_1 = HE_t - \alpha - \beta_4 HEx_{(t-1)} \quad \text{..................} (4.23)$$

To find out adjustment speed of share of GDP_{agr} in short run analysis through vector error correction, equation (5.5) has been established.

$$HE_t = \alpha + \beta_5 GDPagr_{(t-1)} + \varepsilon t_1 \text{ ……(4.24)}$$

$$\varepsilon t_1 = HE_t - \alpha - \beta_5 GDPagr_{(t-1)} \text{ …… (4.25)}$$

Error correction equation for adjustment of GDP_{ser} through VEC has been developed.

$$HE_t = \alpha + \beta_6 GDPser_{(t-1)} + \varepsilon t_1 \text{ ……(4.26)}$$

$$\varepsilon t_1 = HE_t - \alpha - \beta_6 GDPser_{(t-1)} \text{ …… (4.27)}$$

In equation (5.7) error correction equation for variable of GDP_{ser} has been established

$$HE_t = \alpha + \beta_7 GDPmanu_{(t-1)} + \varepsilon t_1 \text{……(4.28)}$$

$$\varepsilon t_1 = HE_t - \alpha - \beta_7 GDPmanu_{(t-1)} \text{ …….. (4.29)}$$

Current study analyzing causality of variables, that's why in second model unemployment rate has been taken as dependent variable and main equation for vector error correction model explained as equation(6).

$$UE_t = \alpha + \beta_1 HE_{(t-1)} + \beta_2 GDPpc_{(t-1)} + \beta_3 GDPg_{(t-1)} + \beta_4 HEx_{(t-1)} + \beta_5 GDPagr_{(t-1)} + \beta_6 GDPser_{(t-1)} + \beta_7 GDPmanu_{(t-1)} + \varepsilon t_1 \text{…….. (4.30)}$$

For second model, to estimate disequilibrium adjustment, equation (6.1) has been developed for higher education enrollment.

$$UE_t = \alpha + \beta_1 HE_{(t-1)} + \varepsilon t_1 \text{…….(4.31)}$$

$$\varepsilon t_1 = UE_t - \alpha - \beta_1 HE_{(t-1)} \text{ …….. (4.32)}$$

Equation (6.2) has been established for adjustment of GDP_{pc} in dependent variable.

$$UE_t = \alpha + \beta_2 GDPpc_{(t-1)} + \varepsilon t_1 \text{…….(4.33)}$$

$$\varepsilon t_1 = UE_t - \alpha - \beta_2 GDPpc_{(t-1)} \text{ ……..... (4.34)}$$

Through vector error correction model to estimate adjustment speed of GDP_g equation (6.3) has been developed.

$$UE_t = \alpha + \beta_3 GDPg_{(t-1)} + \varepsilon t_1 \text{ .....(4.35)}$$

$$\varepsilon t_1 = UE_t - \alpha + \beta_3 GDPg_{(t-1)} \text{.....(4.36)}$$

For adjustment speed of HE_x through vector error model equation (6.4) has been developed.

$$UE_t = \alpha + + \beta_4 HEx_{(t-1)} + \varepsilon t_1 \text{.....(4.37)}$$

$$\varepsilon t_1 = UE_t - \alpha - \beta_4 HEx_{(t-1)} \text{ .....(4.38)}$$

Equation (6.5) has been created to find out adjustment sapped of GDP_{agr} in unemployment rate.

$$UE_t = \alpha + \beta_5 GDPagr_{(t-1)} + \varepsilon t_1 \text{.....(4.39)}$$

$$\varepsilon t_1 = UE_t - \alpha - \beta_5 GDPagr_{(t-1)} \text{.....(4.40)}$$

In vector error correction, for short run adjustment of GDP_{ser} in unemployment rate equation (6.6) has been established.

$$UE_t = \alpha + \beta_6 GDPser_{(t-1)} + \varepsilon t_1 \text{.....(4.41)}$$

$$\varepsilon t_1 = UE_t - \alpha - \beta_6 GDPser_{(t-1)} \text{.....(4.42)}$$

Equation (6.7) has been developed to find out short run adjustment toward equilibrium level of dependent variable.

$$UE_t = \alpha + \beta_7 GDPmanu_{(t-1)} + \varepsilon t_1 \text{.....(4.43)}$$

$$\varepsilon t_1 = UE_t - \alpha + \beta_7 GDPmanu_{(t-1)} \text{ .....(4.44)}$$

(Asari, Baharuddin et al. 2011) in their study for estimation of vector error correction model has used same methodology according to variables of their study.

Chapter 5 RESULTS AND INTERPRETATION

This research examines causality between higher education and unemployment in the light of empirical evidence. Current check the causality weather there is unemployment because of higher education and more graduates in the economy or there is higher education because of more unemployment in the country, that's the reason of considering two empirical models. In order to discover the association among higher education and unemployment, the model of the study ponders the variables inclusive of higher education enrollment, unemployment rate, share of agriculture sector in GDP, share of industrial sector in GDP, share of services sector in GDP, GDP per capita and GDP growth rate.

5.1 Univaribilty analysis

Implementation of Johansen co integration method involves some initial testing. Augmented Dickey-Fuller (ADF) test is applied (See also: Bank, 2015; Faridi & Murtaza, 2013). The research includes tests to ensure that the findings of the unit root are accurate and that the data is not stationary. To put it another way, we're looking for Unit roots. The Augmented Dickey-Fuller test was used to determine if higher education, unemployment, GDP per capita, and the share of agriculture, manufacturing, and services in GDP growth domestic product are all combined and have a unit core (ADF). The Augmented-Dickey Fuller method was conducted to test if the variables are stationary. At first difference if all variables are stationary, Johansen cointegration technique is most appropriate for estimation of variables as if variables are stationary at first difference {Babatunde, 2005 #7}. Many time series variables behave like random walks. All the variables of the model are subjected to the ADF test for the unit root to determine stationarity.

Following table 5.1 represents outcomes of ADF unit root test analysis.

Table 5.1 Results of Unit Root Test

Variables	Level	P Value	Results	1st Difference	P value	Results
HEE	-0.648	0.8459	(0)	-4.183	0.002	(1)
UE	-2.139	0.231	(0)	-5.933	0.000	(1)
HE_X	-2.003	0.283	(0)	-6.698	0.000	(1)
GDP_{Ser}	-0.448	0.889	(0)	-6.192	0.000	(1)
GDP_{manu}	-1.266	0.633	(0)	-6.305	0.000	(1)
GDP_{agr}	-1.589	0.477	(0)	-7.312	0.000	(1)
GDP_g	-3.730	0.008	(0)	-7.403	0.000	(1)
GDP_{PC}	2.063	0.999	(0)	-3.339	0.022	(1)

The Augmented Dickey-Fuller (ADF) test shows all variables are non-stationary at level and stationary at 1st difference. It means that all of our data has been integrated to the first order I (1), as specified by Johansen's cointegration review. At 5% significant level p value of higher education enrollment is 0.0025, p value of unemployment, GDP growth rate, GDP services and GDP manufacturing is 0.0000. P value of GDP per capita is 0.0225.

5.2 Descriptive statistics

We need to run descriptive statistics analysis to analyze general appearance of the dataset of the policy variables. Without implying any test to check dispersion and variability of data descriptive statistics analysis has been done as follows in table 5.2.

Table 5.2 **Descriptive statistics of the data**

variables	UE	HEE	HE_X	GDP_{agr}	GDP_{PC}	GDP_{ser}	GDP_g
Mean	4.0010	5.2336	20.2715	23.9394	6.4653	52.5935	4.5510
Median	4.0266	5.2690	19.2700	24.1000	6.2309	51.3000	4.7819
maximum	7.8300	6.2026	32.2300	27.4000	7.2949	58.8200	7.7058
minimum	0.3977	4.0669	11.8800	20.8800	5.8141	48.0000	1.0143
Std.dev	2.2883	0.7531	4.8545	2.0454	0.5000	3.9937	1.8686
skewness	-0.0781	-0.0836	0.4828	0.0213	0.3812	0.3693	0.0039
kurtosis	1.9457	1.4556	2.7369	1.5959	1.6234	1.3985	2.2984

Jarqua bera	1.6090	3.4185	1.3775	2.7952	3.5083	4.4060	0.6973
Probability	0.4472	0.1809	0.5021	0.2471	0.1730	0.1104	0.7056
Sum	136.037	177.945	668.9600	813.9400	219.8220	1788.1800	154.7360
Sum sq.	172.8002	18.7209	754.1332	138.0670	8.2504	526.3446	115.2316
Observation	34	34	34	34	34	34	34

The standard deviation is the average difference between the data set's values and the mean. When the standard deviation of the data is tiny, it means that the data points are similar to the mean. A high standard deviation indicates that data figures are dispersed over a wide set of items. As standard deviation id measure of dispersion of data set. In economic theory if variability in data set is higher I could not predict reliable results. The greater the dispersion in data the more will be deviation from their mean. In aforementioned outcomes, standard deviation of unemployment is 2.28 and mean value is 4.00 variable of higher education is having standard deviation of 0.75 and mean value 5.23. Standard deviation of higher education expenditures is 4.85 and mean value is 20.27. Standard deviation off GDP growth rate is 1.868 and mean value of GDP growth rate is 4.55. By observing other variables in the table, standard deviation of agriculture shares in GDP having standard deviation of 2.04 and mean value respectively is 23.93, respectively standard deviation of part of service sector in GDP, per capita GDP and gross domestic product having standard deviation as 6.46, 52.59 and 2.94.

A positive skeweness shows that data is positively skewed or skewed right, right skewed data meaning that their extremity of the data is lengthier than the left one. In the same way, if the data is negative, it means that the data is skewed left, meaning that the data's left tail is longer. Skeweness could be equal to zero which mean that data could be perfectly symmetrical which is not quite possible for real world data. There is a rule of thumb for interpreting skewness Bulmer (1979). If the skewness is less than -1 or greater than 1, the distribution is strongly skewed. If the skewness is between -1 and -0.5 or 1 and 0.5, the distribution is slightly skewed. Distribution is approximately symmetric if skeweness is between -0.5 and 0.5.In the above table, except GDP, share of services sector in GDP and GDP per capita all other variables are approximately skewed, and these are moderately skewed. Average skeweness predict well about market fluctuations. This prediction holds even after controlling the liquidity of business cycle

conditions. Also, average skeweness compares favorably with other economic and financial predictors of subsequent market fluctuations. According to Westfall (2014), when kurtosis is large, it means that infrequent extreme deviations account for more variation than regular small deviations. Golden rule for kurtosis is as following.

Mesokurtic distribution is a normal distribution having kurtosis exactly 3.A kurtosis could be less than 3 in any distribution, with this property of kurtosis distribution is called platykurtic. As comparison with normal distribution platykurtic distribution has shorter and thinner tails and its peak is broader and lower. Distribution could also have kurtosis greater than 3, its called leptokurtic. Tails of these distribution are seemed longer and flatter as in comparison with normal distribution and its peaks are higher and sharper. In the above table all distributions are less than 3, which means that distribution is platykurtic. For the estimation of true lag order the probability of estimating for varying degrees of freedom(k) is the interest. For both small and large samples kurtosis does effect some of the criteria considerably. In large samples and for large values of *k* the usual asymptotic theory results for normal models are confirmed.

Jarque-Bera test is a type of Lagrange multiplier test that is commonly used to determine normality. Jarque Bera test has been run for normality conformation, which is used for large volumes of data since other normality tests are not accurate in huge datasets. To match a normal distribution this test matches the skeweness and kurtosis of the data.

5.3 Model 1 Factors Affecting the Unemployment

Following are results of johansen cointegration showing different factors affecting the unemployment rate in model 1.

5.3.1 Results of Johannsen cointegration technique

Table 5.3 displays five co-integrating vectors with suggested statistics, indicating a clear long-run association among model variables.

Table 5.3 **Trace statistics**

Hypothesized No.of CE(s)	**Eigenvalue**	**Trace statistic**	**0.05 critical value**	**Prob.****
None*	0.8080	215.0412	159.5297	0.0000
At most 1*	0.7643	162.2197	125.6154	0.0001

At most 2*	0.6976	115.9650	95.7536	0.0010
At most 3*	0.5827	77.6829	69.8188	0.0103
At most 4*	0.4988	49.7155	47.8561	0.0331
At most 5	0.4385	27.6058	29.7970	0.0877
At most 6	0.2472	9.1323	15.4947	0.3533
At most 7	0.0013	0.0437	3.8414	0.8343

This research has explored null hypothesis and alternative hypothesis based on the interpretation of the findings. If the p value of a given statement is less than 5%, the null hypothesis is rejected; if it is greater than 5%, it is accepted. In first case of trace test, null hypothesis is that there are r co integrating vectors while the alternative hypothesis is that there are n co integrating vectors. Critical values for both tests could be observed in the tables. As discussed below, Ho stands for the null hypothesis and H1 stands for the alternative hypothesis.

Ho: There is no co-integrating vectors.

H1: There is co-integrating vectors.

Decision of accepting or rejecting null hypothesis is made on the basis of p value, here p value from none to at most 4 is less than 5% level of significance, study has accepted alternative hypothesis according to which there is co integration among variables. There is long run association among variables. Results shown that there are 4 cointegrating equations, so that study has rejected alternative hypothesis and has accepted null hypothesis according to which there are 4 cointegrating vectors in the model. Meaning of five co integrated equations is that there is long- run association among variables. These variables have a huge effect on each other in the long run.

On the basis of value of trace figure are greater than critical values, study has not rejected H0, if value of trace statistics is less than critical values. In above table 5.5 at rank none, value of trace statistics is greater than critical statistics and study has accepted null hypothesis on the basis of which there are r cointegrating vectors in the model. Similarly from rank 1 to rank 4 values of trace statistics are superior than critical figure, null hypothesis from rank 1 to rank 4 has been accepted by study and alternative hypothesis has been rejected. From rank 5 to rank 7, trace statistics values are less than critical values so null hypothesis has been excluded and alternative hypothesis has been recognized according to which there are n cointegrating vectors in the model.

Table 5.4 **Max-Eigen value statistics**

Hypothesized No.of CE(s)	Eigenvalue	Max-Eigen statistic	0.05 critical value	Prob.**
None*	0.8080	52.8215	52.3626	0.0448
At most 1*	0.7643	46.2546	46.2314	0.0497
At most 2	0.6976	38.2820	40.0775	0.0786
At most 3	0.5827	27.9674	33.8768	0.2150
At most 4	0.4988	22.1097	27.5843	0.2148
At most 5	0.4385	18.4734	21.1316	0.1131
At most 6	0.2472	9.0886	14.2646	0.2788
At most 7	0.0013	0.0437	3.8414	0.8343

In second case, maximum eigen value test, null hypothesis is that there are r co integrating vectors while the alternative hypothesis is that there are r+1 co integrating vectors.

H0: r cointegrating vectors.

H1: r+1 cointegrating vectors.

In table 5.4 as p value at none is 0.041 which is less than 5% level of significance, analysis has rejected null hypothesis, according to which there are r cointegrating vectors and has accepted alternative hypothesis according to which there are r+1 cointegrating vectors in model. P value at, at most 1 is 0.0497 which is less than 5% level of significance, analysis has rejected null hypothesis on the basis of p value and has accepted alternative hypothesis according to which there are r+1 cointegrating vectors among variables of the equation. There are only two co integrating equations in max-eigen statistics and in both cases study has accepted alternative hypothesis.

On the basis of max-eigen values and critical values, from rank none to rank 1 study has accepted null hypothesis according to which there are r cointegrating vectors and has rejected null hypothesis. From rank 2 to rank 7, max-eigen values are fewer than critical values so on the basis of that study has accepted alternative hypothesis and rejected null hypothesis.From the results of trace test and max-eigen value test, it has shown that there is long run association among variables. For the other model of unemployment, as variables are same only difference is, in first model dependent variable is unemployment while in second model independent variable is higher education enrollment. So association among variables in both models has been same.

Table 5.5 Vector Error Correction in short run (model 1)

Variable	ECM	coefficient	Standard error	t-statistics
HE	-0.03	-0.2127	0.0162	-2.1752
UE	-0.20	-0.1276	0.0199	-7.5285
GDP_{PC}	-0.34	-1.9773	0.4060	-4.8700
GDP_{g}	0.28	-0.1898	0.0199	-9.5071
GDP_{agr}	-0.31	-1.1181	0.0919	-12.1664
GDP_{manu}	0.34	-0.2955	0.0783	-3.7707
GDP_{ser}	0.41	-0.3818	0.0493	-7.7337

The above two table depicts that in Pakistan, there is a dynamically stable long-term relationship between higher education and unemployment. As a result, we can confidently use VECM to assess the cointegrated series' short-run properties in the analysis. VECM was no longer needed if there was no cointegration. The negative and significant coefficient of ECM indicates that an exogenous shock will fizzle out in the long run, and the economy will remain on a stable path in the long run.

In short run analysis, for the dependent variable higher education expenditures, GDP growth rate, higher education enrollment, share of agriculture sector in GDP and GDP per capita have highly substantial impact. While unemployment rate, share of services sector in GDP and share of manufacturing sector have irrelevant effect on higher education enrollment. Value of higher education enrollment in short run which is -0.03 indicates that disequilibrium in short run has been adjusted in dependent variable at the rate of 3%. These outcomes are parallel to the findings of (Bergh and Fink 2008) that government expenditures on higher education has very limited effects on enrollment rate in short run but GDP per capita has explained increase in enrollment rate. results has also consistency with the findings of (Schofer and Meyer 2005) according to which higher education expansion and its impacts has been slowed in linguistically diverse countries. And it has also seen that expansion in enrollment has been often slowed when educational system are under centralized control. That is the reason of less effect of higher education expenditures in short run. Shocks in enrollment rate has not been adjusted through the variable of unemployment, it has indicated that enrollment rate has been increased because of unemployment. These findings have consistency with the conclusion of (Erdem and Tugcu 2012).

GDP growth rate has been adjusted with the rate of 28% the disequilibrium of previous time period of regressand variable in current time period. Part of agriculture sector in GDP has revealed irrelevant values. (Huang, Jin et al. 2009) investigated association of higher education and share of agriculture sector in GDP. According to his findings share of agriculture sector in GDP have significant impact on higher education in long run. But in short run portion of agricultural zone in GDP have insignificant effect on higher education. On the basis of these discoveries, results of current study has consistency with this previous study. Where through Vector error correction model author has concluded that self-adjustment ability of system in short run has been weak and education has serious lagging effect on economy.

These results are reliable with earlier study. In which authors have explored the impact of government expenditures on education and economic growth of Pakistan for the time period of 1980 to 2009 by using johansen cointegration test and vector error correction methods results had designated that education in long run appear to effect the economic development of Pakistan in long run. Results have revealed that education has decisive long run effects on economic growth but in short run results have displayed insignificant association of education with economic growth.

Table 5.6 Static table Model 1

Variable	R square	Adjusted R^2	S.E equation	F-statistic
UE	0.5363	0.3872	1.9166	0.5537
HEE	0.3941	0.1540	0.1891	1.0187
GDP_{PC}	0.1767	-0.1600	0.0717	0.5248
GDP_{g}	0.5116	0.3977	1.6247	2.4606
GDP_{agr}	0.2840	-0.0087	0.7112	0.9699
GDP_{manu}	0.2524	0.0533	1.0870	0.8256
GDP_{serv}	0.3196	0.0413	0.9817	1.1484

In a one-predictor regression, the square of the correlation coefficient equals the R-square, according to (Miles, 2014). R^2 is considered as correlation between predication of regression equation. For this reason R^2 is also considered for indicating the goodness of fit the model. It stretches the percentage in the total dispersion in regressand variable explained by independent variables. Cohen has provided information about the size of R square, small effect is indicated by as R square equal to 0.02, average effect if R square equal to 0.13 and huge effect if value of R

square equal to 0.26. With increase in number of variables, value of R square will increase if number of explanatory variables will increase, it will never decrease. More R square is close to 1 more deviation in regressand variable is explained by independent variables. In long run with the increase in variables, coefficient of determination adjusted for the reduction in degree of freedom as more independent variables are introduced in regression analysis.

The outcomes of co-integration depicted the existence of error correction model. The vector error correction model has been verified for current study. Results indicates short run changing aspects of the model. The error Correction model takes into account both the short and long-term relationships between variables.

In table 5.6 value of R square and adjusted R square has given for all variables. According to which, variations in independent variable has been explained by unemployment rate with the rate of 53% and higher education enrollment with the rate of 39%. Data of expenditures in higher education has explained 67% variation of the model and GDP growth rate has explained 51% variation of the model. Sectorial share of GDP has explained less variation of the model and GDP per capita has explained insignificant variation of the model.

In table (5.6) outcomes of error correction model has confirmed the co-integration which specify the existence of error correction term for expenditures on higher education, higher education enrollment, unemployment rate, GDP growth rate, GDP per capita and sectorial share of GDP. Error correction equation has shown correct negative sign for higher education expenditures, unemployment rate, GDP growth rate, GDP per capita and share of manufacturing sector in GDP.

5.4 Model 2 Indicator Affecting the Higher Education

Following are the results of Johansen cointegration indication different variables affecting higher education.

5.4.1 Result of Johansen Cointegration Test

Table 5.7 **Table of trace statistics**

Hypothesized No.of CE(s)	Eigenvalue	Trace statistic	0.05 critical value	Prob.**
None*	0.8080	215.0412	159.5297	0.0000
At most 1*	0.7643	162.2197	125.6154	0.0001
At most 2*	0.6976	115.9650	95.7536	0.0010

At most 3*	0.5827	77.6829	69.8188	0.0103
At most 4*	0.4988	49.7155	47.8561	0.0331
At most 5	0.4385	27.6058	29.7970	0.0877
At most 6	0.2472	9.1323	15.4947	0.3533
At most 7	0.0013	0.0437	3.8414	0.8343

The error correction model is used as an econometric technique in this study; this approach estimates both a systemic and equilibrium mechanism toward which adjustment is usually made. The process of adjusting to a hypothesised equilibrium by error correction or disequilibrium change. Stationary time series variables are referred to as zero roots or zero-order integrated variables. It is possible for nonstationary variables to have a unit root that is integrated at first order. Unit root series become I(0) when first order integrated I(1). In general, regressions computed with non-stationary data do not have the white noise residuals needed for reasonable inference.

Table 5.8 **Max-Eigen value statistics**

Hypothesized No.of CE(s)	**Eigenvalue**	**Max-Eigen statistic**	**0.05 critical value**	**Prob.****
None*	0.8080	52.8215	52.3626	0.0448
At most 1*	0.7643	46.2546	46.2314	0.0497
At most 2	0.6976	38.2820	40.0775	0.0786
At most 3	0.5827	27.9674	33.8768	0.2150
At most 4	0.4988	22.1097	27.5843	0.2148
At most 5	0.4385	18.4734	21.1316	0.1131
At most 6	0.2472	9.0886	14.2646	0.2788
At most 7	0.0013	0.0437	3.8414	0.8343

It not impossible to estimate regression at first differences, but it might possible that any information of long term relationship approved out by altitudes of variables is vanished. Error correction models solve this problem by estimating a regression in first differences with error correction terms added on top. The error correction method refers to the lagged variations between the real and expected values of the left hand side variable.

Table 5.5 Vector Error Correction in short run (Model 2)

Variable	**ECM**	**coefficient**	**Standard error**	**t-statistics**

HEE	-0.32	-0.0041	0.0020	-2.0352
HE_X	-0.16	0.2313	0.1136	2.0362
UE	-0.36	0.0631	0.0326	1.9343
GDP_{PC}	0.22	0.0018	0.0027	0.6786
GDP_g	-0.26	0.1348	0.0618	2.1814
GDP_{agr}	0.44	-0.0465	0.0236	-1.9689
GDP_{manu}	0.38	0.0675	0.0413	1.6333
GDP_{serv}	0.41	-0.0679	0.0345	-1.9683

In table 5.9, higher education enrollment, expenditures on higher education, growth rate of GDP, portion of agriculture sector in GDP and portion of services sector in GDP have highly significant impact on unemployment rate. Higher education enrollment has significant value of -0.004, which has indicated that from previous time period disequilibrium in unemployment has been adjusted through higher education enrollment in short run with the adjustment speed of 0.4%. Higher education expenditures has shown positive values which has indicated that in dependent variable disequilibrium has not been adjusted in short run by expansion in developed education expenditures.

Association between education more from the angle of higher education than as compare to point of labor market and its demands. Push effects of higher education influence labor market and structure of occupations. Kogan (in Boys et al., 1988, p. 219) has prepared an interesting observation by pointing out that higher education institutions are still expected to respond to labour market needs and demands. In this contrast there has not been enough research about the bond of higher education institutions and labor market's demand. Insufficient education has been observed in findings but not insufficient response from labor market about the expansion of higher education (Teichler and Kehm 1995). These findings of current study are similar to the findings of (Li, Whalley et al. 2014). Unemployment rate has indicated that shocks in short run has not been adjusted by itself. Share of agriculture sector in GDP has indicated significant impact on dependent variable. It has shown that disequilibrium of dependent variable has been adjusted in short run by part of agriculture sector in GDP at the rate of 4%. GDP growth rate has indicated that disequilibrium in dependent variable has not been adjusted in short run by variable and it has further created unemployment by 13%. Share of services sector in GDP has also indicated significant value -0.06 which indicates, in short run from the state of disequilibrium in

dependent variable to current state of equilibrium segment of services sector in GDP has been adjusted with the rate of 6%. Share of manufacturing sector and GDP per capita has shown insignificant impact on unemployment in short run.

Table 5.10 **Static Table of Data**

Variable	R square	Adjusted R^2	S.E equation	F-statistic
UE	0.4321	0.3345	1.7654	0.8765
HEE	0.3798	0.2234	0.2387	1.2987
HE_X	0.7134	0.3876	2.8765	2.2167
GDP_{PC}	0.1987	-0.2356	0.8765	0.4476
GDP_g	0.4376	0.8763	1.3476	2.3465
GDP_{agr}	0.3278	-0.8754	0.2876	0.9035
GDP_{manu}	0.7654	0.9865	1.1287	0.7654
GDP_{serv}	0.8976	0.0416	0.9867	1.1365

As this static table explains that value of R square and adjusted R square has given for all variables. According to which, variations in independent variable has been explained by unemployment rate with the rate of 43% and higher education enrollment with the rate of 37%. Data of expenditures in higher education has explained 71% variation of the model and GDP growth rate has explained 43% variation of the model. Sectorial share of GDP has explained less variation of the model and GDP per capita has explained insignificant variation of the model.

5.5 Granger causality test

Granger causality test is a statistical hypothesis test for time series data that is suggested in 1969. Granger causality test is best for forecasting. Since, according to Clive Granger, causality across variables in economics can be tested by determining the way to predict values of a time series given past values of another time series. According to the post hoc ergo propter hoc principle, one thing following another could be used to prove causation. Because of this, econometricians say that the granger causality test is a reliable causality test.

The way of determining whether two variable is causality related is measured by granger causality test. Empirical data sets technique is used to find correlation patterns between variables, this process is probabilistic causality account. Causality is not related with cause and effect but it is strictly related to the idea of cause and effect. If a variable X is causal to a variable Y, it implies that X causes Y or that Y causes X. The granger causality analysis has not checked

the cause and effect relationship between variables, but it does want to know whether one variable precedes another. There is no causal link in the true sense of the word it means that there is granger causality in the data. In econometrics, the term "cause" simply refers to "granger cause," a more apt term being "precedence." Granger causality is a bottom-up technique based on the premise that data-generating processes in time series are explanatory variables (Leamer 1985). To check correlation of data sets, they are analyzed. The contrary of this method assumption is that it is not independent and data sets analyzed if they are independently from **every** other. Variation in Y explained through the null hypothesis but variation in Y being not explained through the lagged values of X, it is assumed in other words that X does not granger cause Y. if two variables are related at an instantaneous moment in time to find out test of granger causality could be run. Main steps for running the test are as following:

Study has made two hypothesis, null hypothesis and alternative hypothesis. According to null hypothesis y(t) being granger cause by x(t) and according to opposite of null hypothesis which is alternative hypothesis , y(t) being not granger cause x(t).

As main variables of this study are, higher education enrollment and unemployment rate. For analyzing relationship between two variables, study has applied granger causality test on these variables. As according to previous literature higher education in case of Pakistan is increasing because people are unable to find good jobs after completing their education and this further increase in higher rate of unemployment of educated youth does include the factor the economy does not have enough capacity to absorb highly educated people which is creating more unemployment. For testing this theory in the light of empirical evidences study has applied granger causality test.

Table 5.12 has shown findings for independent variables of granger causality test.

Table 5.11 **Results Of Granger Causality Test**

Null hypothesis	observations	F-statistics	Prob.
GDP_{PC} does not granger cause GDP_g	32	2.4065	0.1092
GDP_g does not granger cause GDP_{PC}	32	0.3263	0.7244
GDP_{agr} does not granger cause GDP_g	32	1.9071	0.1681
GDP_g does not granger cause GDP_{agr}	32	0.1105	0.8958

GDP_{ser} does not granger cause GDP_{g}	32	0.8456	0.4404
GDP_{g} does not granger cause GDP_{ser}	32	0.4194	0.6616
GDP_{manu} does not granger cause GDP_{g}	32	1.0527	0.3629
GDP_{g} does not granger cause GDP_{manu}	32	0.0712	0.9314
GDP_{agr} does not granger cause GDP_{PC}	32	6.3941	0.0053
GDP_{PC} does not granger cause GDP_{agr}	32	2.2476	0.1251
GDP_{ser} does not granger cause GDP_{PC}	32	0.9062	0.4160
GDP_{PC} does not granger cause GDP_{ser}	32	2.2036	0.1299
GDP_{manu} does not granger cause GDP_{PC}	32	1.8254	0.1805
GDP_{PC} does not granger cause GDP_{manu}	32	8.4719	0.0014
GDP_{ser} does not granger cause GDP_{agr}	32	3.1554	3.15541
GDP_{agr} does not granger cause GDP_{ser}	32	2.6092	0.0920
GDP_{manu} does not granger cause GDP_{agr}	32	0.9373	0.4040
GDP_{agr} does not granger cause GDP_{manu}	32	4.4516	0.0213
GDP_{manu} does not granger cause GDP_{ser}	32	4.6015	0.0191
GDP_{ser} does not granger cause GDP_{manu}	32	3.6440	0.0397
XT does not granger cause YT.	28	2.8287	0.4537
XT does granger cause YT.	28	0.3143	0.0376

GDP_{PC} does not granger cause GDP growth rate. Study has accepted this hypothesis as value of p is greater than level of significance which is 0.1092. GDP growth rate also does not granger cause GDP_{PC} as value of p is greater than level of significance 5% so analysis has accepted this hypothesis. Same as in case of all variables study has accepted null hypothesis except share of manufacturing in GDP and share of services in GDP. In causality between sectorial shares of GDP value of p is less than significance level based on the results of which it has accepted that GDP_{manu} does granger cause $GDP_{ser.}$

Higher education is denoted by XT.

Unemployment is denoted by YT.

According to first null hypothesis:

Ho: XT does not granger cause YT.

H1: XT does granger cause YT.

Golden rule here is, null hypothesis will be rejected by study if value of p less than level of significance which is 5 percent and accept alternative hypothesis. if value of p is greater than level of significance which is 5 percent null hypothesis will be accepted by study and alternative hypothesis will be rejected.

In first null hypothesis, p value is 0.0478 which is less than 5% level of significance, study has rejected null hypothesis according to which higher education does not granger cause unemployment and has accepted alternative hypothesis according to which higher education does Granger cause unemployment.

According to theory of Jonaidi (2012) there is not causal relationship between education and unemployment rate. According to his analysis, education level will improve the quality of human resources as in form of increased knowledge and skills of a person. Productivity of an individual will increase by increase in knowledge and skills. A firm or industry will get more productive results by hiring a person with enhanced skills and knowledge. This theory has contradiction with the results of research conducted by Farley(1987) according to his analysis there are some conditions attached with education and employment opportunities. As more rich people are tend to get more education as compare to those who have less resources. People with more resources will get more higher education and in case of employment opportunities they will get higher position and people with less resources will occupy a position with low rank. So it is income condition which further decide about employment opportunities more than education.

Between short term and long term gap, Teuling (1995,2005)attempts to analyze by explaining the dynamic trends, according to his analysis highly educated people are more skilled in complex jobs

And that is the reason they demand higher salaries for complex jobs. However in long run the increased supply of highly graduate increased, this increased supply puts pressure on the wage rate of complex jobs. It also put pressure on the highly educated people in to jobs of lower wages where skills requirements could be less. From here it could be concluded that in first order condition the effect of education on level of employment and income has been observed positive but in second order condition effect on employment rate and income has been observed as negative. With this analysis other economists does not agree, according to Acemoglu (2002),

education does not have diminishing returns to education. According to his analysis due to higher education, further innovation will be promoted by increase in level of investment and technology as by developing human capital. Now here positive externality of innovation is derived by higher education. Diminishing returns of education will be reduced by this positive externality. According to his argument, which is based on data analysis after 1970, because of skill requirement differentiation inequality in wages exist in labor market.

According to second null hypothesis:

Ho: YT does not granger cause XT.

H1: YT does granger cause XT.

Rule is same again, null hypothesis will be rejected by study if value of p less than level of significance which is 5 percent and accept alternative hypothesis.

In second null hypothesis p value is 0.9196 which is greater than 5% level of significance, study has accepted null hypothesis according to which unemployment does not granger cause higher education and has rejected alternative hypothesis according to which unemployment does granger cause higher education.

For checking affiliation of unemployment rate and higher education Fullan and Loubser (1972) analyzed that there is qualitative relationship between education and employment as educated people could enhance their adaptive capacities, their abilities to generate new ideas and solution for problems. So people with more education are tend to have more good employment opportunities as compare to those who are less educated. Globerman and BAartel (1987) investigated workers with higher education have advantage in execution and adjustment of new technology. So they tend to get better employment opportunities. In several studies it has been observed that, workers with higher level of skills face less duration of unemployment. Even though if they lose a job, there is highest possibility that they will get another placement and will be reemployed again. Nickell (1979) investigated relationship of unemployment and higher education through empirical analysis in United kingdom According to his conclusion, up to 12 years each duration of unemployment could be reduce by each year of schooling by 4% and people with qualification more than this ordinary level, the duration of unemployment could be reduced by 12 percent. According to another economist Mincer(1991) however relationship between unemployment and education is found confounded by endogeniety of education. Causal effect of education has not been represented by it. There are some not observed variables which

are related with both variables, reasons of unemployment could be other than education. There could be effective correlations among the opportunity of employment and education on regular least squares and estimates may overestimate the results of each variables and failed to correctly painting the causal courting among two variables.

In most OECD countries, in earlier time periods education level and unemployment rate were inversely related. According to (O Higgins, 2001) underemployment and unemployment in developing countries are common for educated people. However under the crisis of 2008 global economic crisis, unemployment and underemployment among educated people become more increasing visible. This problem of educated unemployment affect the both developed and developing world over all. Reason which have been told about this underemployment is that, there is mismatch between demand and supply of educated labor.

The factors which are responsible for the unemployment of educated young people also includes, Demand for experienced segments in job market is high as compare to fresh graduates. Job opportunities are also low due to lack of resources and overpopulation. More educated people are available for the position of less educated person, wages over all are low and mostly segment is not willing to work for long hours and less wages.

5.6 Economic theory of long run association among variables of model 1 and model 2

The discussion below is about the long run association of variables which are used for empirical analysis.

5.6.1 Higher education expenditures and unemployment rate

On the explanation of higher education expenditures and funding patterns a earlier economical officer and state finance skilled, Harold hovey claims that higher education obliges for state as wheel balance in finance. Higher education is an appealing choice for heavy cuts when state revenues are low. So, higher education has capability to assemble charges for its services and when revenues of state are higher, higher education is fascinating zone for politicians to capitalize money (Delaney and Doyle 2007). To the state expenditures on higher education a little empirical attention has been paid by (Tandberg and Ness 2011). According to their evidence process of investing higher education is political process particularly. Through empirical analysis they have proved that increasing expenditures in higher education includes numerous political factors which effects on the process significantly. Increase in higher

education expenditures could not decrease unemployment rate. Instead of increasing expenditures these resources could be used for generating opportunities for qualified youth.

5.6.2 Higher education enrollment and Growth domestic product

In the number of theoretical models, the role of higher education is emphasized as a element of economic growth. According to neoclassical theory, an economy can only develop in the long run if technological advancement increases the effectiveness of labour force. In endogenous growth theory, learning or education is the only key determinant for achieving for accumulation of economic growth. Most empirical studies support the results of endogenous growth theory, according to which growth of economy is generally result of endogenous factor not external factors. According to this theory, investments in human resources, skills, and creativity are the most key factors to economic development. The theory is based on the idea that a knowledge-based economy can lead to economic development, and that an economy's long-term growth rate is determined by policy steps. Barro and Lee (1993) found strong relationship between educational enrollment and per capita growth rate over the countries. They documented a affirmative correlation among human capital and growth by educational attainment. The relationship of education enrollment and GDP growth has not received adequate courtesy in the context of developed countries but human capital stock has significant policy implications to the third world states. According to Krueger and Lindahl (2001) strong impact on educational enrollment or educational development would not hold strong impacts on development due to decreasing returns of education in developed countries. According to them investment in education for developing countries is necessary in early stages of development when results of educational improvement are great. Their implications are strong and important as, in early stages of development developing countries face the limitation in resources and countries with limited resources may not have the luxury of realizing long term benefits of investment in education. Educational investment is expensive and may not yield high returns in short term therefore countries with limited resources may delay investment in education until they reach a sustainable level. Caselli and Coleman investigated that poor countries which are abundant should use unskilled labor more efficiency and choose technologies which could be more appropriate for unskilled labor and growth of GDP. From their observations it is concluded that prioritizing higher education in developing countries may result in suboptimal allocation of unskilled labor as well as the countries resources.

5.6.3 Unemployment rate and GDP

Okuns law propose relationship between unemployment and GDP. It describes the movement's rate of unemployment and GDP. The unemployment rate move counter cyclical with real GDP growth rate. This statement was based on macroeconomic empirical data analysis. Aghion and Howitt (1994) provided results by analyzing the relationship of unemployment and GDP growth rate in their research model. From their results they estimated two results; first was, higher growth increases the rate of unemployment due to high capital returns, here capitalization effect was addressed, as an increase in growth cause raise in investment revenues from generating employments and lessens the balance degree of unemployment. The second was duration of job match is being reduced by higher growth in GDP. Increases in growth have a wealth redistribution impact, which decreases the period of work matches by indirectly and specifically increasing the equilibrium level of unemployment. Explicitly by increasing the rate of job separation, and implicitly by prohibiting the development of new job openings. Eriksson 1997 investigated relationship of growth and unemployment, according to his research there is decisive association among unemployment rate and growth rate whether there is endogenous growth or exogenous growth. However, according to his research, economic growth can be affected in a variety of ways, including shifts in capital tax rates, consumer preferences, and unemployment benefits. When such changes occur, it has been discovered that what is good for development is also good for jobs. If any government wants to increase both economy's growth and employment rates as well, stimulate growth is not possible directly rather it should expand those encouragements which could collectively impact the labor's performance market and rate of growth.

5.6.4 Relationship of higher education enrollment and GDP growth rate

According to the study on the effect of education on economic growth, standard growth equations based on the dynamic Cobb-Douglas aggregate output function are used, which straightforwardly comprise human capital as a key factor of economic growth. However the relationship between human development thorough educational development and reforms has been discussed by human capital theorists. Investing in human growth is usually lighten by educational factors (Kim, 1998). It is understood theory that human development and enhancement of human skills, is only possible through formal education system. In most developing countries it is believed that key component for development and growth is expansion

in educational policies. (Mercan and Sezer 2014) analyzed about the improvement in level of education and growth rate of GDP in case of turkey. Improvement in education enrollment affect economic growth positively by growing knowledge production capacity and labor productivity. The effectiveness of a country's educational system is directly linked to its development performance. Efficient educational systems contribute greatly by educating skilled labour force and increasing other positive economic aspects. It was concluded that with increase in higher education expenditures, it would have decisive effect on the growth rate of the economy.

5.6.5 Relationship of sectorial share of GDP and unemployment rate

The development of an economy is fueled by fundamental changes, and these fundamental changes are not free. The high rate of unemployment is the most undesirable and difficult expense of these general changes. If firms will produce a product in declining market with new technological innovations, will lay off workers. These employees will be unemployed until they requalify and are matched to a new job in a growing product section or innovative knowledge. When looking at the economic structural changes in greater depth, it is clear that the economy's growth rate initially appears to be declining, but that it eventually surpasses the initial rate of economic growth. According to (Bassanini et al. 2000), introducing innovative technologies into the economy boosts growth rates. Fastest and largest growing sector in the world is service sector of the economy. In most developed countries it has largest share in total output of the economy. In low income states the portion of services sector in GDP is 47 percent, countries with middle income economies, have almost 53 percent of service sector share in their total output of GDP and high income countries part of services zone in GDP is 73 percent. The trend of economic development, according to (Fuch, 1980), is a change in population from agriculture to manufacturing and then from manufacturing to services. (Kongsamut et al, 2001) estimated through data of 123 countries of 10 years that increase in services sector raise per capita GDP and provide more employment opportunities. These economies are shifting away from agriculture and toward the service sector, with less emphasis on manufacturing. In Pakistan, the proportion of the services sector in all aspects of the economy has increased over time. In the Pakistani economy, the growth rate of the services sector outpaces that of the manufacturing and agricultural sectors. Services zone has strong linkages with industrial sector and agriculture sector as well it provides essential inputs for industrial and agriculture sector accounts for 54 percent of total GDP of the economy and total job creation is one third. Although the

contribution of the services sector has increased steadily over time, it has risen from 39 percentage of Gdp in 1960 to 53.3 percent of GDP in 2009-10. As a result, the services sector accounts for the majority of Pakistan's GDP. Cross-county research findings indicate that a country's structural transition occurs in phases. The first stage will see a decrease in agriculture sector share, which will be offset by a nearly equivalent increase in the manufacturing sector, while the share of the services sector will remain constant or decrease. In the second stage of economic development, the manufacturing and service areas are substituted, while the farming industry remains unchanged. This means that services sector advantages at the behalf of cultivation sector. Reason behind increase in service sector is because of increase growth rate in finance and insurance sector. The importance of the services sector in major economic activities is growing, and it contributes significantly to value added and gross fixed asset development in Pakistan. Portion of job creating opportunities in services is growing as people are moving from agriculture and industrial region to services region. It is also vital source of revenue as 26 percent of returns are acquired from taxes compared to 1 percent which are received from agriculture region. Pakistan is agricultural state but because of urbanization, the share of GDP from agriculture region is declining over the time because people are moving towards other sectors of economy for better job opportunities. The portion of services sector in job generating opportunities is growing over time because it provides job opportunities for all skilled, semi-skilled and high skilled individuals according to their qualification. In 1973 share of services sector in total employment was 27 percent which has increased to 34.5 percent in 2009. In 2009 about 2.76 million people were employed in services sector which includes business services and real estate.

5.6.6GDP growth rate and higher education enrollment

Accumulation of human development is the main engine of growth. Difference in living standard of diversified states because of their disparity in human development. According to (Lucas, 1993) physical capital for growth also plays important role and indispensable but absolutely subsidiary role. Human development, according to modern growth theory, has a positive effect on economic development. Human capital has a significant statistical decisive effect on per capita income growth. (Artadi and sala-i- Martin 2003) investigated in their study that as enrollment rate even in primary education had been as those as in OECD states, the usually per

head income growth rate in underworld states have been 2.37 percent instead of 0.9 percent which is documented in developing economies. Physical capital is important because if developing nations invested at the same rate as developed nations, income per capita would have increased by 0.44 percent. Even this supplementary evolution would have only 30 percent of the growth which developing countries could have through development in education. This shows that impact of higher education on per capita growth of GDP id much larger as compare to physical development and growth. Literature also demonstrates that human capital education has a positive effect on income growth rates, regardless of the level of education, as it is evident that any level of human capital education is directly associated to GDP growth rates.

According to few scholars (Romer, 1990) and (Jones, 1999), importance in research and development is important for growth in per capita and GDP in third world states. According to (Petrakis and Stamatakis, 2002) if with the level of income educational attainment in countries increase, surprisingly higher education will become more important for the growth of GDP.

Chapter 6 DICUSSION AND CONCLUSION

6.1 Discussion

Higher education is important for economies because of its ability to accumulate human development. More human development could increase efficiency of economy which could further lead toward economic development. Main reason for investing in higher education is to get good employment opportunities. What if because of more higher education unemployment starts increasing? Or what if because of more unemployment, people want to increase their skills and enrolled for further higher education? For checking this causality analysis between higher education and unemployment, current study has been held.

After knowing the patterns of variables in history of country for empirical evidence a two models has been created. Which are to untangle the effect of higher education of unemployment rate quantitatively and the effect of unemployment rate on higher education. In first model unemployment rate has been taken as dependent variable and other variables including higher education has been taken as independent variables. In other independent variables, higher education enrollment, growth rate of GDP, per capita GDP and sectorial share of GDP has been taken. Data of these variables has been taking from 1985 to 2018. Because of non-availability of data before that it has been taking from 1985. In second model dependent variable has been taken as higher education enrollment. Data of masters, MPhil and PhD enrolled students has been taken from United Nations educational, scientific and cultural organization. Independent variables in second model are same except for unemployment rate. Now unemployment rate has also taken independent variable to untangle its effect on higher education enrollment. To check the reliability of data set, descriptive statistics test has been done. Where mean, median, standard deviations and other values has been observed. After descriptive statistics, correlation test among variables has been done. Correlation test has been done to check out the extent to which two or more variables fluctuates together. There could be positive and negative fluctuations of variables together which creates problem of multicollinearity. Correlation test could only be used when variables are on same scale. Value of correlation could lie between 1 to -1. Positive and negative signs are used for the direction of variables. If variable is more near to 1, there would be more association among variables. If there exists association among variables it leads toward multicollinearity which leads further towards spurious results of models. It has

observe in current variables there is no problem of multicollinearity. Only in case of higher education expenditures there has observed little association among variables, it is because if there is increase in growth rate of GDP, per capita GDP or sectorial share of GDP, it would lead toward more expansion toward higher education expenditures. It was no possible to replace higher education expenditures variable or to omit it. As study has estimated two variables, two correlation matrix's has been estimated first for higher education enrollment, second for unemployment rate.

For estimation technique, stationarity of variables have been checked through unit root test. All variables are stationary at first difference. On the basis of unit root analysis johansen cointegration analysis has been applied. For best results of time series data which has been observed stationary at first difference, johansen cointegration is best for empirical results. To hypothesis has been taken for trace statistics and max-eigen values. In trace statistics null hypothesis has been that there are r cointegrating equations in the model, and alternative hypothesis has been, that there are r+1 cointegrating equations in the model. According to results of johansen cointegration, there has been five cointegrating equations in trace statistics, which is a strong evidence for long run association among variables. And study has rejected null hypothesis from none to at most four and has accepted that there are r+1 cointegrating equations in the model. In case of maximum-eigen values statistics, there has observed two cointegrating equations. Same here, two hypothesis has been made. To check causality relationship among variables, granger causality test has also been applied. In time series data granger causality testis a way to investigate causality between tow variables. To find out the patterns of correlation empirical data sets has been used. According to results of test, there is unilateral causality between higher education and unemployment rate. Higher education enrollment has observed as cause of increase in unemployment rate, economy of Pakistan has weak absorption capacity for highly qualified young graduates.

Vector error correction model has been estimated to check the adjustment of variables in short run. Primary motivation for choosing vector error correction model is to avoid model misspecification bias which is inherited in VAR in first difference. This error correction model, provide estimates of both a structural and equilibrium process toward which generally adjustment is affected. In long run where all variables adjust toward hypothesized equilibrium, in

short run for the dependent variable higher education enrollment and unemployment rate has been observed respectively. In higher education enrollment, unemployment rate, GDP per capita and share of manufacturing sector having not significant impact in short run adjustment. Higher education enrollment on dependent variable has effected with slow rate of 3% in short run which has consistency with the findings of (Bergh and Fink 2008). Adjustment of higher education in short run is low because in developing economies like Pakistan enrollment in higher education could not show its effects in short run, if people are graduating in 4 years effects on economy could be observed in long run. Growth rate of GDP has adjusted with 10% rate in short run, people could spend more on higher education if there would increase in short time period. Sectorial share has adjusted rapidly inn short run because Pakistan economy is agriculture base economy and mostly population working for services sector and manufacturing sector. These results has consistency with the findings of (Huang, Jin et al. 2009). In case of unemployment rate, higher education enrollment, GDP growth rate, share of agriculture sector and share of manufacturing sector having highly significant impact on unemployment. Higher education enrollment has adjusted disequilibrium of dependent variable in short run with slow speed because absorption capacity of economy for highly qualified youth is weak. Higher education expenditures has negative effect on unemployment rate in short run, if resources are being allocated for higher expenditures in short run instead of creating job opportunities for graduates, disequilibrium of unemployment rate would not adjust. These findings has similarity with the results of (Li, Whalley et al. 2014).

In nexus between higher education and unemployment, along with many other factors which cause unemployment higher education enrollment has also its effect. Because of higher education enrollment in the country unemployment rate over the years has been increased. Some policy implications has been suggested to policy makers to overcome this problem.

Through combining the findings of cointegration and error correction estimation for higher education and unemployment rate. Higher education and unemployment nexus implies that government should not invest in higher education more than economy accommodate. Instead of this policies should be designed for promoting fixed capital investments. Increasing job opportunities and expending absorption capacity of economy could be more helpful than that only increases in expenditures of higher education. Study has concluded that unemployment in

Pakistan increases the demand for using higher education as a tool for solving the problems of unemployment. Job placement mechanism is also ineffective. Increased efficiency in job placement mechansim department could also helpful. Government should take initiatives for effectiveness of job placement mechanism. Over a decade ago a policy was recommended by ILO(international labour organization) sponsored to restrict supply of educated youth, which seems not have been tried by policy makers in Pakistan. Policy makers should take into consideration this policy. Channel to stop supply of educated youth should be used in a way that people should focus on learning skills and not collecting degrees. According to results of the study, two years mandatory wait is recommended before enrollment for degree. People who participate in land reclamation, health, education or other productive programs could lead toward entrepreneurship where a higher education degree is not required. The real problem is less employment capacity of educated human in labor market. Policy may be devised to shorten this lag. Outcomes of labor market appear disconnected from abilities of individuals and skills .the structure of labor market suggests that even if institutions features higher quality human capital which is unlikely to rewarded in labor market. According to the situation changes in composition of higher education institutions and their incentives is not sufficient solution for higher education and labor market mismatch .increase in quality of information about skills of students and enhancing them according to demands of labor market is necessary (Assaad, Badawy et al. 2016)

6.2 Conclusion

Unemployment is burning issue not only in case of developing countries but in case of developed countries also. There is large literature on unemployment both on international and national level. But this study is different as it has checked nexus between unemployment rate and higher education. Higher education is observed to be an instrument for better employment opportunities but in current study examines the causality between higher education and unemployment rate. Current study is based on the annual time series data over the phase of 1985 to 2018. Study applies Johansen cointegration test for analyzing the long run association among variables. Error correction model has also been used to check short run association among variables and adjustment of variables in short in case of fluctuations. The cointegration analysis indicates that there is long run association among variables. According to results, higher education graduates are one of the factors which result unemployment rate in case of Pakistan in long run. In short

run analysis through vector error correction, estimates shows that higher education also increases the unemployment rate in Pakistan. These results has consistency with (Schomburg 2000),(Woodley and Brennan 2000) and (Moreau and Leathwood 2006) but in contrast with (Núñez and Livanos 2010). In addition, according to causality analysis, there is unidirectional causality between higher education and unemployment in case of Pakistan. It seems there is increase in unemployment because of more higher education. Through research analysis it has been observed that unemployed educated people are somehow shared their blame for this problem. Their sector and job preferences as well their wage expectations indicated that they have a lack of market realism. There is also problem of demand and supply of graduates, problem could be addressed from supply side. One approach for restricting enrollments rates have been suggested user chargers at the university level. Subsidy to higher education can no longer taken for granted, families should think about enrollment in higher education. It has been observed that consequences of unemployed graduates are potentially serious. They have very less employment opportunities in labor market and they blame themselves for not succeeding in getting employment. The real problem is less employment capacity of educated human in labor market. Policy may be devised to shorten this lag. Outcomes of labor market appear disconnected from abilities of individuals and skills .the structure of labor market suggests that even if institutions features higher quality human capital which is unlikely to rewarded in labor market. According to the situation changes in composition of higher education institutions and their incentives is not sufficient solution for higher education and labor market mismatch .increase in quality of information about skills of students and enhancing them according to demands of labor market is necessary (Assaad, Badawy et al. 2016).

6.3 Policy Recommendation

Increasing rates of youth unemployment needs serious attention by policy makers. Not only to alleviate the problem but also to minimize frustrations faced by the new graduates in workforce. Results of the study give idea about some policy implications or recommendations which may be helpful in immediate solution of this problem in case of Pakistan.

Following are the policy recommendation for policy makers.

- From the side of higher education institutions, national qualification frame work should be finalized and explained to employers. With the involvement of all social partners,

objectives of higher education institutions should have alignment labor market policies. In order to combat unemployment among highly educated individuals interaction between universities, Higher Education Commission of Pakistan and industrial sector is crucial. So that universities can educate students in accordance with requirement of economy and available human capital can be utilized in efficient manner.

- Cooperation of employers with higher education institutions should be priority. Government should establish a program to facilitate but not finance between higher education institutes and employers.

- More support should be given to graduates that aspire to establish their own small business.

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