Forman Journal of Economic Studies
Vol. 4, 2008 (January–December) pp. 41-57

Output Growth and Employment Generation in Pakistan

Kalsoom Zulfiqar and M. Aslam Chaudhary[1]

Abstract

Human resources have emerged as one of the most important sources of economic growth and development. However, Pakistan has ignored human development and the result is that it is facing high unemployment. Present study aims at exploring the employment generation capacity of the economy of Pakistan. The economy is divided into six distinct sectors and the contribution of each sector towards creation of employment opportunities is analyzed; both in short run and long run. Labor force imbalances and the resulting unemployment are pointed out by utilizing ARIMA methodology. The sectoral employment elasticities are low and decreasing over time. It may be so due to increasing trend of using capital intensive technology. The empirical projections indicated that Pakistan is suffering from high unemployment and it is expected to rise over 14 percent by the year 2020. Therefore, appropriate policies are needed not only to combat this issue but also for optimal utilization of human capital. Overall growth as well as employment generating sectors need to pay appropriate attention to tackle the issue.

I. Introduction

The output growth and employment generation are two important goals of any major economic policy. The provision of productive employment for continuously increasing labor force is an integral part of growth policy. The rate of employment growth in an economy is determined by many factors and GDP growth is one of these factors. The impact of GDP growth on employment growth is measured by employment elasticities. Internationally the range of growth and employment elasticity is between 0.1 - 0.7. However, high employment elasticities are generally considered healthy indicator for an economy; facing unemployment problem. The same may be expected low for some sectors, for example low employment elasticity for agriculture sector implies that the farm sector is unable to generate sufficient employment opportunities to absorb the growing labor force. So, employment elasticities provide us important information; including about structural changes taking place in an economy. The present study investigates the relationship between GDP growth and employment for Pakistan; both in short and long run. In

[1] *The authors are Lecturer and Professor at Departments of Economics, Punjab University and Forman Christian College (A Chartered University), Lahore, Pakistan.*

Pakistan, since the year 2000, the economy grew at an average rate of 5% but unemployment rates hardly fell. This implies a rising trend in unemployment which increased from 6.3% in 1996 to 8.27% in 2004[2]. It is even higher for current period. The result is that, unemployment is expected double digit. This apparent divorce between output growth and employment growth is a matter of serious concern. Thus, there is a need not only to investigate the problem in detail but also analyze its severity.

There are several studies which have explored the relationship between output and employment by focusing on employment elasticities. Baqai (1979), Kemal (1990) and Chaudhary and Hamid (1994, 1997, and 1998) have all computed employment elasticities. These elasticities are computed directly from the data or on the basis of regression models. These regression models Chaudhary (1994) and (Chaudhary and Hamid 1997, 1998) do not take into account the non-stationarity of the time series data. Therefore, these results are hardly realistic. If a regression relationship among variables is explored, which are non-stationary and then the resultant regression is simply a spurious regression. Besides, that, none of these studies distinguishes between long run and short-run behavior of the problem. Present study utilized appropriate methodology to study this relationship and to find out long run and short run employment elasticities. The study also provides forecasts for unemployment and labor force imbalances in the coming years for Pakistan.

The rest of the study is organized as follows. Part II, consists of literature review. Part III, provides discussion pertaining to data and methodology. Empirical analysis is provided in part IV. Conclusion and policy implications are provided in part V.

II. Literature Review

There is an ample literature on the subject matter which explored different aspects of unemployment. Seib (1970) carried out international comparison of man power to highlight long-term manpower requirements of Pakistan. The study projected man-power requirements for various sectors and occupational groups for the period 1961-85. But these projections were unrealistic as they were based on the average performance of the economy.[3] Similarly, the study does not mention any specific techniques used to obtain these results.

Baqai (1979) made projections for population, labor force and employment. He also calculated employment elasticities for various sectors and for the economy as a whole. The projected employment elasticities for the period 1978-2000 were 0.30 for the agriculture, 0.35 for manufacturing, 0.64 for construction, 0.55 for services

[2] *See: Pakistan Economic Survey, 2004-05 & 2008-09.*

[3] *It may be noted that the performance of Pakistan's economy fluctuated a lot over time. Its' growth rate was as high as 8% for one year while it fell to as low as 2% in other year. For details see: Pakistan Economic Survey, 2008-9.*

and 0.33 for the economy as a whole. The study suffered from two major drawbacks: firstly, it followed major departure from prevailing trends and secondly, there is no mention of the methodology used to make these projections. In real terms, none of these forecasts turned out to be realistic. The projections were far from reality.

Pakistan/Netherlands project on human resources (1981) projected labor demand and supply according to occupations, sectors and education levels. This study used already available estimates, based on previous data for education to estimate imbalances and unemployment at different education levels. However, as the study used old estimates and completely ignored the changing pattern of employment and structural changes which reduced the validity of the study. Besides, GDP and sectoral elasticities used were also changed over time. Therefore, the validity of results of study is questioned. The results of the study did not match with the actual performance of the economy, which clearly indicates poor quality of the study.

Herman and Irfan (1989) projected employment and unemployment for Pakistan using simulations model. On the demand side, two types of demand were recognized, namely the labor demand for productive activities and labor demand by education sector. In this study for simulation purposes, the value addition of various sectors is assumed to be growing; as indicated in the 7th five year plan. On the supply side, the labor supply is determined by the behavior of individuals instead of technical factors. It is assumed that labor supply will grow by 5% to 5.5%. Thus, the labor absorption was 0.34%. The labor demand will increase only by 1.7% to 1.8%. The population is assumed to grow at the rate of 3.15%, which actually grew by 1.8% since 2001. On the basis of these assumptions, it was projected that unemployment will rise from 5% in 1989 to 15% in 2003. The study also concluded that crude activity rate will rise from 29.4% to 31% leading to severe unemployment. This study suffers from several drawbacks. The assumptions for population growth were much higher than reality and same was the case for other variables, thus the estimates could not reflect the real picture. Moreover, the demand for labor is divided into two categories, demand for production sector and demand for education sector. But education sector is a part of services sector, which was completely ignored in this study. Half of the Pakistan's economy consists of services sector which has been ignored in the study. Besides, the simulation process in this study is based on the projected growth rates of seventh five year plan which were never actually met.

Ghayur (1990) provided a detailed account of unemployment among educated people in Pakistan. He highlighted that the labor force participation is very low and in spite of this, it is facing wide spread unemployment and under-employment. High levels of open unemployment are common to the urban areas and under-employment to the rural areas. He calculated demand and supply imbalances for educated manpower in Pakistan. According to him, unemployment rate for those having matriculation and above education is 46% for the year 1986-87. It is the highest for matriculation which is 49% and lowest for graduates which is 20%. For

post-graduated it is about 32%. He also highlighted the problems in obtaining reliable data for Pakistan and stressed the need for an effective and efficient labor market, information system to ensure accurate analysis of the labor force. The employment and underemployment levels pointed out in this study were never observed in Pakistan.

Gulbrandson (1990) analyzed human resource situation in Pakistan using integrated projection and planning tools, called Macbeth Human Resource Planning Laboratory using the data from 1981 to 1988. According to the projections made by the study, labor force unemployment would quadruple over the projection period and exceed 3 millions in 1998-99.The main deterioration in unemployment situation will hit those with primary education. As much as one quarter of this labor force would be unemployed in 1998-99. But those having secondary education will start feeling lack of job towards the end of 1990s' and their unemployment rate will be about 12%. Only the situation of illiterates will not worsen. The study suggested that high unemployment could be checked only if the economic growth rate is accelerated to 7% per annum. However, it is difficult to believe that unemployment of illiterates will not increase. Similarly, an unrealistic population growth rate was assumed which never occurred in the history of Pakistan.

Kamal (1990) worked out sectoral balances and imbalances for the sixth five year plan. In order to measure the gap and imbalances, he estimated the demand and supply of labor force keeping in view the changes in investment, employment elasticity and past sectoral growth rates. As the study was limited to that period, its estimates were not very helpful for future periods. He projected 3% growth in the demand for professional and skilled manpower by using professional employment coefficients. Since the projected growth of manpower was biased upward so it exceeded the actual supply.[4]

Chaudhary (1994) analyzed labor market situation and made projections for the period 1992-93 to 2000-01. He divided the whole economy into three major sectors, i.e. agriculture, manufacturing and services and four educational levels. By assuming that GDP, population, labor force and other variables will grow at existing rate and trends, he projected labor demand, supply and imbalances. According to his findings, unemployment situation will worsen over time if the same trends continue. Unemployed labor force will rise from 2 million in 1993-94 to 4 million by 2000-01 and unemployment rate is expected to rise in the same period from 6% to 10%. As far as different educational levels are concerned, high unemployment rate was found for all educational levels; except for professional and technical education. The highest unemployment during this period will be for those having matric and above education. Those having professional and technical education will remain short in supply. This study is an improvement over previous studies as it seems much closer

[4] *This part of literature review is based on the M. Phil dissertation of Abdul Hameed, QAU, (1995) and Chaudhary and Hamid (1998).*

to reality. However it also suffers from certain deficiencies as it does not provide a comprehensive analysis of various situations which can in the country over time. The most of its projections are based on previous trends and variables which can change over time.

Chaudhary, M. A. and Hamid, A. (1998) divided economy into nine sectors, seven occupations and four educational levels. It was pointed out that employment elasticity was the highest for construction sector and lowest for the manufacturing sector. The agriculture sector is not likely to absorb much of additional labor force in future. Thus, to promote employment opportunities, there is a need to focus on sector (s) with high employment elasticities. There is also a need for sound employment generation policy, which should induce labor intensive technologies. Similarly, as the share of agriculture and related occupations is decreasing over time, therefore, there is a need to look for employment generation opportunities in alternative sectors and in other occupations.

Noman (1998) analyzed various dimensions of the problem of unemployment in Pakistan; for International Labor Organization (ILO). The objective of the study was to analyze labor market trends in the country and to develop possible elements of an unemployment strategy during Pakistan's ninth five year plan period (1997-98 to 2001-02). In this report, two central issues were taken into account. Firstly, the key to employment growth is the revival of manufacturing sector. Secondly, the linkages with other sectors and certain policy tools required for this revival were needed.

Mueen (2001) reviewed the labor market in the 1990s and discussed the deteriorating condition of labor market. The unprecedented rise in the unemployment rate, especially in the late 1990s was alarming for the economy. Underemployment rates also showed a rising trend during the period under consideration. The study particularly points out the worsening conditions for new entrants. The division of population according to their poverty status and labor market activity suggests that most of the poor were either unemployed or underemployed. The study suggests that policy intervention was necessary to alleviate poverty by focusing on labor market. The expenditure on social sector development needs to be increased and by providing training facilities that lost their jobs in the process of privatization and down sizing; need to be readdressed.

Burki (1990), Kemal and Mehmood (1993), and Sher (1995) have examined the structure of the informal sector by conducting surveys in different cities at different time periods. These studies highlight the main features of the informal sector and pointed out the growth constraints faced by this sector. These studies categorize the informal sector workforce as consisting of self-employed, regular workers, family helpers and apprentices. A substantially low capital labor ratio has been observed in the production process of informal sector. Kemal and Mehmood (1993) estimated that the informal sector can create fourteen times the number of jobs that the rest of the economy can with the same level of investment. All these studies

have consistently found lower wages prevailing in the informal sector as compared to formal sector because the informal sector faces problems in obtaining raw material at lower cost and in marketing its output.

In the light of above studies and non-reliability of their results, there is a need to carry out a comprehensive study which must utilize appropriate methodology and address the issue so the results could provide foundations for policy formulation. Thus, this study is focused to identify short-run and long run employment elasticities for the economy as a whole and for major sectors of the economy. Moreover, projections will be carried out for overall labor force imbalances and unemployment rate for various sectors.

III. Methodology and Data Sources

We have utilized the Johansen's test for co- integration and error correction methodology. The co-integration test requires that the concerned data series should have the same order of integration. The order of integration of a series is the number of differencing required for making a series stationary. The study uses Augmented Dicky Fuller (1979) test for unit root, to determine the order of integration. After determining the order of integration of all series, co-integration test is applied. Co-integration is a statistical tool describing the long run behavior of economic data series. The co-integration test reveals the existence or absence of any long run relationship among variables. To study the long run relationship between growth and employment following Error Correction Model has been estimated.

$$D \log (Et) = D \log E(t-1) + D \log Yt + D \log Y(t-1) + \lambda \log E(t-1) - \lambda c - \lambda \log Y(t-1) + vt$$

Where, E_t denotes employment in time period t and Y_t refers to output in time period t. Similarly, Error Correction model is estimated for the major sectors of the economy in which employment of each sector is regressed upon output of that sector. For forecasting the labor force imbalances and unemployment rate, moving average (ARIMA) modeling approach is used. The Box–Jenkins methodology or ARIMA modeling technique is a class of linear time-series forecasting techniques that captures the linear dependency of the future value on the past. An ARIMA model includes three parameters. These are the autoregressive parameter (p), the number of times the series is differenced (d) and the moving average parameter (q).

The data series for 1975 to 2007 has been taken from the Pakistan Economic Survey, Labor Force Survey of Pakistan and other related official publications for empirical analysis.

IV. Empirical Results

The time series data have been tested for stationarity by using ADF test and it was found stationary in the first difference form. The Johanson's co-integration test shows that output and employment are co-integrated because hypothesis of no co-

integrating equation is rejected both at 1% and 5% level of significance. The results of both ADF test and cointegration test are reported in appendix.

Following error correction models are estimated for the overall economy and for its' various sectors**.**

D log (Et) = 4.876+0.352D log E(t-1) + 0.129 D logYt + 0.1815D log Y (t-1) -0.233 log E(t-1) – 0.0273 Y(t-1) Adj R^2 = 0.639

Agriculture sector

D log (Et) = -0.1484+0.1137D log E(t-1) + 0.0936 D logYt + 0.1235D log Y (t-1) -0.2825 log E(t-1) – 0.0387 Y(t-1) Adj R^2= 0.5543

Mining and Manufacturing sector

D log (Et) = 11.6488+0.2098D log E(t-1)+0.1732 D logYt -0.2768D log Y (t-1) -0.3704 log E(t-1) – 0.0752 Y(t-1) Adj R^2= 0.5822

Trade sector

D log (Et) = 1.1106+0.0675D log E(t-1)+0.1854 D logYt + 0.20675D log Y (t-1) -0.4274 log E(t-1) – 0.1392 Y(t-1) Adj R^2= 0.506

Construction sector

D log (Et) = -5.5353+0.4511D log E(t-1)+0.3972 D logYt - 0.13375D log Y (t-1) -1.0608 log E(t-1) – 0.6380 Y(t-1) Adj R^2= 0.5296

Electricity Gas & Distribution sector

D log (Et) = -2.9153-0.02361D log E(t-1)+0.1739 D logYt -0.2393D log Y (t-1) -0.5121 log E(t-1) – 0.1226 Y(t-1) Adj R^2= 0.5196

Transport& Communication sector

D log (Et) = -6.3244+0.1897D log E(t-1)+0.2635 D logYt + 0.1189D log Y (t-1) -0.6495 log E(t-1) – 0.1438 Y(t-1) Adj R^2= 0.6907

1. Overall Employment Generation Capacity

On the basis of above estimated models for the economy as a whole and for six major sectors of the economy of Pakistan, short-run and long-run employment elasticities are calculated. The table 1 shows short run and long run employment elasticities for Pakistan. Overall for the economy, the short run and long run elasticities are 0.13 and 0.11, respectively. It means that ten percent increase in GDP leads to generate 1.3% jobs in the short run and only 1.1 % jobs, in the long run. The elasticity is very low, if we compare the growing labor force; which grew about 2.5% per annum, during this period, it appeared that, on average, about one percent of the labor is added to unemployed reservoir every year.

Table: 1. Sectoral Employment Elasticities

Sectors	Short-run employment elasticities	Long-run employment elasticities
Overall	0.13	0.11
Agriculture	0.09	0.13
Mining & Manufacturing	0.17	0.20
Trade	0.18	0.32
Construction	0.39	0.60
Electricity,gas& Dist.	0.17	0.24
Transport & communication	0.26	0.22

Source: computed by the authors

The low employment elasticity and backlog of unemployed labor is an alarming signal which requires immediate attention of the policy makers. There is a need to formulate employment policies which can ensure both GDP and employment growth in the long run, which absorb the growing labor force.

In the Agriculture sector, the employment elasticity is even lower than the overall capacity of job creation. It is the largest sector in Pakistan in terms of employed labor force. It provides livelihood to almost two-third of population. The key fact about agriculture is that about 65% of the population relies upon agriculture. The employment elasticity of agriculture sector is 0.13 in the long run and 0.09 in the short run. In the long run, for every ten percent increase in agricultural output, employment increases by 1.3 percent. This elasticity is falling overtime; it was 0.3 before 1980.[5] The agriculture -GDP share is low; as compared to other sectors. One of the possible options is to reduce the number of dependent on agriculture sector by creating non-farm employment opportunities. For this, the policies in the long run should focus on enhancing productivity per worker and productivity per hectare.

The employment elasticity for mining & manufacturing sector is 0.20 and 0.17 in the long-run and short-run, respectively. It may be noted that it is one of the growing and promising sector which is expected to absorb growing labor force, since as the country grows, this sector flourishes more than the other sectors. The low again employment elasticity of manufacturing sector can be attributed to neglect of small scale industry, use of more capital-intensive techniques, high costs of production and non-availability of skilled and trained manpower. There is a need to further improve the employment generation ability of this sector by establishing small scale and agro based industries as well as encouraging labor-intensive

[5] *For details see: Chaudhary and Hamid (1998) and Chaudhary M. A. (1994).*

technology. Another important aspect is that a job can be created at a low cost, as compared to large scale industry. For the trade sector the long-run employment elasticity is 0.32 and short run employment elasticity is 0.18. There is a need to analyze how far services sector is able to absorb the labor force displaced from other sectors of the economy. Services sector has to play a vital role in employment generation particularly when employment elasticities in commodity producing sectors are either stagnant or declining.

The construction sector has a long run employment elasticity of 0.60 and 0.39 in the short run. It is also a growing sector and large employment can be enhanced. The analysis by Jehangir & Nazli (2000) shows that, although, this sector has the highest employment elasticity but overall its size and growth is very low; rather, it is one of the lowest as compared to other sectors. Although, the employment elasticity is reasonably high for this sector but a question also arises about the quality of labor, absorbed is poor.

The long run employment elasticity for Electricity, Gas & Distribution sector is 0.24, and short-run employment elasticity is 0.17. Electricity, gas & distribution sector is capital intensive in nature and employment generation depends upon installed capacity. There is a need to enhance the installed capacity of capital, so that the demand for labor can be enhanced.

Table 1 also provides long run elasticity of 0.22 and 0.26 for the short run for Transport & Communication sector, respectively. It may be noted that this sector is not also able to absorb much of the growing labor force. In the long run, if this sector grows at 10%, it will create 2.6% jobs. The services sector is large but again the elasticity is not satisfactory. However, there is still a scope for its expansion particularly for the communication sector.

The above discussion pertaining to employment elasticities of major sectors of the economy indicated that there is a need for a shift in public policies focused on employment generation. The main sectors like manufacturing and agriculture are not absorbing the additional labor. This is mainly due to the increased use of capital-intensive technology in both these sectors. But unfortunately the effects of these declining employment elasticities are not properly countered by increase in employment elasticities of other sectors like services sector. As discussed above, only construction sector has a relatively higher employment elasticity of 0.60, and then comes Electricity, Gas & Distribution. An important dimension of the problem is that, on the one hand the share of construction sector is small in employment, besides it absorbs mostly unskilled and semi-skilled labor. All these factors taken together have aggravated the problem of unemployment in Pakistan.

2. Labor's Demand and Supply Imbalances

Table 2 provides projections for demand and supply of labor force for the future period up to the year 2020. The details of ARIMA models' application are provided in the appendix. The last column of the table 2 shows expected

unemployment rates. It clearly indicates a rising trend in unemployment rates in the coming decade. This rate is expected to be as high as 14.69% in 2020. These forecasts can be rationalized on many grounds, particularly, if we keep in mind the low employment elasticity with respect to output in the long run, as provided in the last table. Besides that, increasing participation rates of females in economic activity, low employment elasticities of major sectors, mechanization of agricultural sector, and the uses of more capital-intensive techniques are some of the sources for such high unemployment rates.

Another very important factor, which should be taken into account, is that although various government documents claim a low population growth rate of around 2.0%. It may be noted that about 28.69% of the total population is in the age group of (5-15) years. These 28.69% people, assuming labor force participation rate (LFPR) of 35% implies that 12931.45 thousands persons will be entering in the labor

Table: 2. Labor Force Imbalances and Unemployment

Year	**Labor force** (Millions)	**Employment** (Millions)	**Imbalance** (Millions)	**Unemployment** (%)
2000	38.82	36.23	2.59	6.67
2001	39.68	36.80	2.88	7.25
2002	40.52	37.38	3.14	7.74
2003	41.37	37.96	3.41	8.24
2004	42.22	38.53	3.69	8.73
2005	43.09	39.11	3.98	9.23
2006	43.95	39.69	4.26	9.69
2007	44.81	40.26	4.55	10.15
2008	45.66	40.84	4.82	10.55
2009	46.51	41.42	5.09	10.94
2010	47.37	41.99	5.38	11.35
2011	48.23	42.57	5.66	11.73
2012	49.09	43.15	5.94	12.10
2013	49.94	43.73	6.21	12.43
2014	50.80	44.30	6.50	12.79
2015	51.65	44.88	6.77	13.10
2016	52.51	45.46	7.05	13.42
2017	53.36	46.03	7.33	13.73
2018	54.22	46.61	7.61	14.03
2019	55.08	47.19	7.89	14.32
2020	55.93	47.76	8.17	14.69

Source: Calculated by the authors

market looking for the job. While there is only 8.89% of the total population in the age group (45-59) years; about 4020.8 thousand will be leaving the labor market. Again an increasing pressures on the supply of labor, on the face of limited capacity of the economy to generate jobs. So, the unemployment rates are expected to further aggravate when these baby-boom generations will enter the labor market.

3. Employment Generation by Sectors

Table 3 provides projections of employment levels for the major sectors of the economy by 2020. Here, it is expected that agriculture sector will absorb 3.79 million additional workers between 2005 and 2020; while providing employment to 23.13 million workers by 2020. During the same period the manufacturing sector is expected to employ additional 2.11 million workers. Similarly, 1.9 million, 0.82 million, 0.039 million and 0.75 million workers are expected to be absorbed in Trade, Transport, Electricity, Gas & Distribution and Construction sector, respectively. Overall, 45.5 million workers will be absorbed against the total labor supply of over 56 million people. Thus, unemployment could rise to as high as 18% of the labor force. It is an alarming figure of expected unemployment for the policy makers and for the government to draw its' immediate attention towards this problem. It is not only important that a large segment of the labor force will be unemployed but it also deserve attention due to waste of human resources as well as loss of output.

Table: 3. Employment Generation by Sectors

(Millions)

Year	Agriculture	Mining & Manufact.	Trade	Transport	Electricity Gas&Dist.	Construction
2005	19.34	5.44	6.09	2.45	0.326	2.42
2006	19.62	5.65	6.20	2.51	0.329	2.47
2007	19.84	5.76	6.30	2.56	0.330	2.52
2008	20.12	5.86	6.41	2.62	0.331	2.57
2009	20.35	6.08	6.51	2.67	0.333	2.62
2010	20.62	6.18	6.62	2.72	0.336	2.67
2011	20.85	6.29	6.72	2.78	0.338	2.72
2012	21.12	6.50	6.83	2.83	0.341	2.77
2013	21.35	6.61	6.93	2.89	0.345	2.82
2014	21.62	6.82	7.04	2.94	0.348	2.87
2015	21.85	6.93	7.46	3.00	0.350	2.92
2016	22.12	7.03	7.57	3.05	0.353	2.97
2017	22.36	7.16	7.67	3.10	0.355	3.02
2018	22.63	7.29	7.78	3.16	0.358	3.07
2019	22.86	7.42	7.89	3.21	0.362	3.12
2020	23.13	7.55	7.99	3.27	0.365	3.17

Projected by the authors.

IV. Conclusions and Policy Implications

The main focus of this study was to find out short run and long run employment elasticities for the economy as a whole and also the same was to be identified for major sectors of the economy. Based upon these empirical foundations expected absorption of growing labor force for these sectors was to be identified. Moreover, unemployment up to the year 2020 was to be highlighted.

Based upon the estimated employment elasticities and absorption capacity of the economy, imbalance in the labor market has been identified. The results show that the growth process in Pakistan is unable to generate sufficient needed employment opportunities, which could absorb the growing labor force. Overall, as well as, sectoral low employment elasticities led to create high unemployment rate in Pakistan. The growing trend of unemployment is expected to continue in the next decade. The major finding is that Pakistan is suffering from double digit unemployment which is expected to grow further by the year 2020. It is expected that unemployment may be as high as over 14 percent in future. The high rate of unemployment is mainly attributed to the use of capital-intensive techniques by major sectors of the economy, slow growth and mismanagement of human resources. It may be argued that low employment elasticities may be desirable for some sectors i.e. agriculture, but this decline in employment elasticities has to be balanced by a rise in employment elasticities of other sectors. It may be noted that it is not happening; rather it is declining in all sectors. This study also indicated that in the past most of the studies had estimated higher employment elasticities; as compared to this study. The employment elasticities have been declining over time both for all the sectors and for the economy as a whole. It is an alarming signal for the policy makers and for the labor force.

The study suggests that there is an urgent need; not only to encourage the application of labor–intensive techniques, developing small-scale agro based industries but also to accelerate the overall growth of the economy to match with the growing labor force. Besides that, there is a need to focus on the development of the sectors having high employment elasticities to further enhance their employment generation capacity. It is a need of the hour to realize the gravity of the situation and to take necessary steps in the right direction to tackle the unemployment problem.

Appendix Tables

Table: A.1 ADF – Statistic

Variable	level	Conclusion	First difference	Conclusion
Loge	-1.8801	I(1)	-3.7689	I(0)
Logy	-0.0714	I(1)	-3.8312	I(0)
logEa	-1.3620	I(1)	-3.4523	I(0)
logYa	-2.0577	I(1)	-5.2108	I(0)
logEm	-0.9004	I(1)	-3.3060	I(0)
logYm	-1.5634	I(1)	-3.6630	I(0)
logEt	-1.7123	I(1)	-3.6651	I(0)
logYt	-3.1105	I(1)	-7.0384	I(0)
logEc	-1.6571	I(1)	-4.9773	I(0)
logYc	-1.0526	I(1)	-3.3435	I(0)
Logged	-2.5715	I(1)	-4.8572	I(0)
logYgd	-2.4140	I(1)	-3.3523	I(0)
logEtc	-2.5715	I(1)	-4.8572	I(0)
logYtc	-2.4140	I(1)	-3.3523	I(0)

* Significant at 1%. ** Significant at 5%.

Table: A. 2 Johansen's Co-integration Results

Series	Null Hypotheses	Alternative Hypotheses	Eigen value	λ max
Log(E) and log(Y)	$r = 0$	$r > 0$	0.6850	30.66*
	$r \leq 1$	$r > 1$	0.1629	4.09
Log(Ea) and log(Ya)	$r = 0$	$r > 0$	0.6891	26.88*
	$r \leq 1$	$r > 1$	0.2188	4.69
Log(Em) and log(Ym)	$r = 0$	$r > 0$	0.6853	27.01*
	$r \leq 1$	$r > 1$	0.0692	1.578
Log(Et) and log(Yt)	$r = 0$	$r > 0$	0.9981	32.318*
	$r \leq 1$	$r > 1$	0.1558	3.728
Log(Ec) and log(Yc)	$r = 0$	$r > 0$	0.4479	25.055*
	$r \leq 1$	$r > 1$	0.2405	7.388
Log(Egd) and log(Ygd)	$r = 0$	$r > 0$	0.6630	28.543*
	$r \leq 1$	$r > 1$	0.2877	6.748
Log(Etc) and log(Ytc)	$r = 0$	$r > 0$	0.6891	26.88*
	$r \leq 1$	$r > 1$	0.2188	4.69

* Denotes rejection of hypotheses both at 1% and 5% level of significance.

Table: A. 3: The ARIMA Model: 1, Dependent Variable is D log (F)

Variable	Coefficients	Std. Error	t- ratio
Constant	0.0265	0.00375	7.0641
AR (1)	0.7245	0.1360	5.3266
MA (1)	-1.5201	0.3538	-4.2912
$R^2 = 0.5765$	Adj. $R^2 = 0.5362$	RSS = 0.00216	DW = 2.09

Table: A.4: The ARIMA Model: 2, Dependent Variable is D log (E)

Variable	Coefficients	Std. Error	t- ratio
Constant	0.020	0.0010	19.460
AR (1)	0.5084	0.2378	2.1377
AR (2)	0.1321	0.2659	0.4968
AR (3)	-0.1343	0.2476	-0.5423
MA (1)	-1.8901	0.4329	-4.3652
$R^2 = 0.7291$	Adj. $R^2 = 0.6562$	RSS = 0.0034	DW = 1.97

References

Asian Regional Team for Employment Promotion, (ARTEP), (1983) & (1985). *Employment and structural changes in Pakistan's Economy*. Bangkok.

Amjad, R. (1987). Human resource planning: the Asian experience. Dehli: ILO/ARTEP.

Axel, H., & Supan, B. (1991). Panel data analysis of the Beveridge curve: is there a macroeconomic relation between the rate of unemployment and vacancy rate? *Economica, Vol. 58.*

Banuri, T. & Kemal, A. R. (1997). Human resource development, in Just Development, Oxford University Press.

Baqai, M. (1986). Pakistan's pattern of development and prospects. *Pakistan Economic & Social Review,* pp. 25-42.

Bielen, S., & Tunny, G. (2003). Duration–sensitive unemployment rates, labor market research unit Queensland. *Working paper.*

Bijou, Y., & Roger, (2001). Equity based redefinition of underemployment and unemployment and some measurements. *Review of Social Economy*, *Vol.59*, pp. 133.

Boorah, V., K. (2002). A duration sensitive measure of unemployment rate: theory and application. *Labor Review, Vol. 16(3),* pp. 453-468.

Claude, S. (2002). Should the informal sector be considered in LDC economic policy? *ILO working paper.*

Chaudhary M. A. (1994). Human resource planning and imbalances in Pakistan. paper presented in *Pak-Aims conference*, Lahore.

Chaudhary, M. A., & Hamid, A. (1998). Unemployment in Pakistan. *Pakistan Economic & Social Review.*

Chaudhary, M. A., & Hamid, A. (1999). Human resource development and management in Pakistan. *Ferozesons*, Lahore.

Dennison, E. F., and Chung W. K. (1984). How Japan's economy grew so fast. Washington. D. C. The Brookings Institute.

Dennison, E. F. (1985). Trends in American economic growth, 1929-1982, Washington D. C., The Brookings Institute.

David, A. C. (1992). Does Europe need more immigrants? Population and work force projections. *International Migration Review*, *Vol.26 (2),* Special Issues The new Europe: Europe and International Migration. pp. 413-461.

Ghayur, S. (1987*).* Unemployment in Pakistan: An overview of future prospects. Islamabad*:* Pakistan Manpower Institute, Islamabad.

Ghayur, S. (1990), Educated unemployment in Pakistan: estimates of imbalances in the current flow. *The Pakistan Development Review*, *Vol. 28 (4) (winter).*

Ghayur, S. (1991). Employment and manpower information in Pakistan: identification of the invisibles in Pakistan. *The Pakistan Development Review, Vol. 30 (4) (winter).*

Ghayur, S. (1990). Combating unemployment in Pakistan. *The Pakistan Development Review, Vol. 31 (4) (winter).*

Government of Pakistan: Various issues of the *Pakistan Economic Survey*, (1995-96, 2005-06 and 2007-08). GOP, Ministry of Finance, Islamabad.

Government of Pakistan, Various issues of the *Labor Force Survey* (1992-93, 1999-00, and 2003-04). Islamabad. Federal Bureau of Statistics, Economic Affairs and Statistics Division.

Government of Pakistan: Vision 2030, (2006) *Approach Paper*, Planning Cmmission, Islamabad.

Hamid, A. (1995). The management of human resources, unemployment and their prospects in Pakistan. M. Phil Thesis, Quaid-i-Azam University, (QAU) Islamabad.

Hamid, S. (1991). Determinants of the supply of women in labor market: a micro analysis. *The Pakistan Development Review*, *Vol. 30(4).*

Haq, I. (1993). Gaps in employment strategy of the National Manpower Commission: an alternative strategy. *The Pakistan Development Review*, *Vol. 32(4).*

Herman, B., & Irfan, M. (1989). Manpower planning in Pakistan: statistical pitfalls. The *Pakistan Development Review*, *Vol. 28(4).*

Holger, & Strobl, (2002). The incidence of visible underemployment: evidence for Trinidad and Tobago. *Credit Research papers No 01/10.*

Irfan, M. (1982). Wages employment and trade unions in Pakistan, *The Pakistan Development Review, Vol. 21(1), (spring).*

Irfan, M., & Kemal, A. R. (1983). Employment and manpower projections for the sixth plan period in employment and structural change in Pakistan's Economy --- *Issues for the eighties*. Proceedings of an ILO/ARTEP seminar, Bangkok.

ILO: Global Employment Trends for Youth (2004).

Jones, B. Ethel. (1971). The elusive concept of underemployment. *The Journal of Human Resources,* Vol. 6(4), pp 519-24.

Kazi, S., and Raza, B. (1991). Duality of female employment in Pakistan, *The Pakistan Development Review, Vol. 30(4).*

Landman, O. (2004). Employment productivity & growth. ILO.

Majid, N. (1999). Employment strategy for Pakistan. ILO, *UNDP*, project.
(Mahboob-ul- Haq Center for Human Development (MHCHRD), (2003). On Unemployment in South Asia, Islamabad.

MHCHRD: (1997), On human development in South Asia, Islamabad.

Mueen, Z. (2001). Poverty and labor market linkages in Pakistan. MIMAP technical paper series No.7.

Nazli & Jehangir, (2000). Population employment & the state of human resources. 50 years of Pakistan's Economy. Oxford University Press.

OECD (2001). Revised OECD measures of structural unemployment, OECD Economic Outlook. pp. 155.

Piertro, G. (2004). The estimation of employment and value-added of informal sector in Pakistan. Meeting of expert group on informal sector.

Paul, S. (1991). On the measurement of unemployment. *Journal of Development Economics, Vol. 36.*

Rafi, S. K., & Zahid, A. S. (1986). Some findings on the unemployed highly educated persons in Pakistan, *The Pakistan Development Review*, *Vol. 35(4).*

Robinson, W. C. & Abbasi, N. (1979). Underemployment in Pakistan*: The Pakistan Development Review*, *Vol. XVII(4) (winter)*.

Ruud, K. (1970). Manpower and educational requirements of Pakistan, Islamabad: Planning Commission, Government of Pakistan.

Summers, L. H. (1992). Investing in all the people. *The Pakistan Development Review*, *Vol. 31(4).*

Slack, T. & Leif, J. (2003). Underemployment in America: measurement and evidence, *American Journal of community Psychology*. Vol. 32 (1-2), pp. 21.