Human Capitalization and Labor Market Absorption Capacity

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Abstract

This paper examines the changes of the degree of job absorption over time in job categories of Engineering, Computer Sciences, Business Administration and General subjects. We estimated a time-delay index explaining time-delay to get the first job after completing studies in the respective disciplines. Applying convergence criteria on the time-delay series in each category, surprisingly, the longest delay was found to be in the case of graduates from computer science, but as expected the undergraduates and graduates from general group showed little absorption capacity. On the other hand, engineers were found to be preeminent with least delay in getting the job. Business graduates were second specifically due to high market absorption capacity for those who major in marketing. Overall there was weak correlation found across the selected specialized groups, except for engineering and business graduate groups. Our study shows that market absorption capacity of graduates from business and general fields has become healthier. In case of Business graduates, a highest convergence rate is observed. Computer Science graduates do not show good signs in building the labor market absorption capacity as the delay index of this group increases over time. General group, considered as underdogs, found satisfactory tendency to labor market joining capabilities particularly from the share of

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graduates from mass communication and journalism. With such findings, balanced labor and educational policies can be grafted, such that each area of skills and knowledge demand gets its due share in the job market and the absorption capacity for one category does not remain low.

Keywords: Human Capitalization, Labor Market Absorption Capacity, Convergence.

1. Introduction

Underemployment is always a critical issue for the under-developed world. In Pakistan, even individuals with higher education are also facing pressures of joblessness. Number of employment opportunities continue to lag behind the growing labor force. Today, Pakistan is ranked 6th among the most populous countries in the world. With labor force participation rate about 32 per cent, the current labor force consists of approximately 52 million men and women. Javed et. al (2008) reports about 3.2 per cent labor force enter the labor market annually in search of employment in Pakistan but with low productivity. As such, there is a requirement to increase labor productivity through effective educational policies. This must go along with creating jobs in the country to sop up the new and already existing labor force.

Economic growth is supported by economic development, and with this emerges a requirement for skilled labor and thus higher education. Sadly, due to ineffective capitalization process in developing countries where the job markets are not absorptive enough, the human capitalization reflects an imbalance between labor demand and supply and therefore builds a sense of job insecurity. The human capital approach explains that investment in education causes higher productivity of workers and thus economic development, however it ignores the issue of labor market absorption capacity.

Education and labor market are highly related to each other, and help in achieving high standards of living. In order to achieve the

benefits of higher education, the labor market should have the ability to absorb the workforce. After completing their education, the labor force starts to search for jobs. Depending upon the labor market absorption capacity, the time spent by labor force on job search varies.

In this paper we intend to examine how the degree of job absorption has changed over time in professional groups such as Engineering, Computer Sciences, Business Administration and General Studies.[1] For the analysis, an index has been estimated explaining time delay in getting the first job after completion of studies. We will also test whether this index converges over time. A convergence sign may suggest that labor market signals an improvement in absorption capacity of the labor force, in various fields, in a relatively shorter time after the completion of their studies. This declining trend would also reflect that probability of being unemployed is declining in each field of work. The rest of the paper is organized as follows. Section II gives a review of previous research. Data and methodology are explained in section III. Section IV provide the results and the paper is concluded with some recommendations in section V.

2. Literature Review

Likelihood of getting a job is dependent on job availability in the market (the vacancies) and relates to job specialization and characteristics for which an individual receives education. Further, the attainment of higher wages has long been considered as the primary objective of employees. However, other job attributes such as the working conditions, future wage prospects and the amount of work timing may influence the mobility (and search) behavior of employees as well, causing an increase in the time period an individual remains unemployed. The above-mentioned and other such conditions may

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[1] In general group usually there are graduates from the fields of International Relations, Mass Communications, Islamic Studies, Pakistan Studies, Urdu, English etc.

influence delay in getting a job not only due to market absorption capacity but also due to job-seeker's preferences.

Alia (2000) looked into the role played by the informal labor market during the last decade (1988-1998) concerning labor supply absorption in Egypt. The researcher found informal labor market and the overall informal sector growing with time. Most of the informal units were also found to be working over 10 years. Poverty was noted to be a dominant characteristic of the female informal workers and thus reduced the pressure on formal labor market to build labor supply absorption capacity.

Mortensen (1986) is of the view that a framework in which the mobility behavior of unemployed individuals is analyzed is related to the job search theory. For job search, the strategies are proposed to describe the search behavior of job hunters. Clark and Lawrence (1979) believed that since a technical definition of being unemployed might not reveal whether the unemployed individual is actually searching for a job, the search theory avoids this problem by assuming that job-seekers are actually doing a job search. Authors argue that search decision must be distinguished from decision to accept or reject an offered job that has been received by the employee and similarly compared with those candidates who did not get any offer due to weak labor market absorption capacity.

"The amount of search or the period of being unemployed depends on the wage rate that the individual thinks one's services can command in the labor market and on the opportunity cost of the searching activity. If an individual believes that his skills or services are highly valued, he will reject job offers that fall short of his expectations and remain unemployed. On the other hand, if the cost of information is large, the individual will tend to limit his searching activities (Ophem (1991))". The author points out that job offers arrive periodically and the job-seekers accept or reject them, therefore individuals continue to search

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and prefer to remain jobless unless they identify a job that is worth at least what is desired.

Arif et al. (2001) examined that since unemployment patterns are high and some type of unemployment spells are modest; often unemployment prevails for long durations, indicating that burden of unemployment is not evenly distributed but falls more on those unemployed people who face it for a longer duration of time. Authors signified the view that the welfare consequences of unemployment become important in examining the labor supply absorption capacity.

Education can be seen as present consumption (investment) to achieve long-term returns (income, social priority). In order to attain the goals of education, labor market should create quality jobs for absorbing educational output (Glytsos, 1990). The decision towards allocating financial and time investment in education becomes important when job market signals, in terms of labor supply absorption capacity, the academic domains possessing least index of job search time. Author was also of the view that over-supply of graduates does not mean joblessness, however their relative wages will be reduced and their aspirations will be adjusted towards accepting less meaningful jobs. This means an increasing number of graduates are likely to be absorbed in occupations e.g., clerical jobs where rewards are low.

Small and Medium-sized firms are often seen as engines of growth in the economy. In economic policy, this is a general argument for supporting small businesses. The role of small businesses in creating jobs was earlier mainly studied with small firms' labor shares. Recently, increased availability of micro data on establishments and firms has made it possible to study job dynamics behind the net employment flows. There has been a growing interest in gross job creation and gross job destruction rates by firm or establishment size, but the findings have been quite conflicting. Some of the latest studies have questioned the

superior role of small businesses in net job creation and emphasized the role of measurement errors (Davis et al., 1996).

Lippman and McCall (1976) state that in each period the job-seeker either obtains a job offer (which may be accepted or rejected), or gets no employment offer. If the offer is rejected or one gets no job offer, one continues to search for the job at some cost.

By determining which area of human capitalization pays fast by providing employment with least time delay and what type of human capitalization needs the longest delay, our objective of the study is to examine labor supply absorption capacity for four undergraduate and graduate level human development measures.

3. Data and Methodology

In all, 1168 respondents were requested to fill the questionnaire (see appendix I). The respondents were undergraduates and graduates from Engineering[2], Computer Sciences, Business Studies, and General specialization fields of Islamabad and Rawalpindi. The sample has male and female respondents but this study doesn't cover gender based comparative analysis. The respondents' year of graduation was taken from 1991 to 2008. We developed nine intervals each of two years of time from 1991-92 to 2007-08 with at the most 20 respondents in each period for each field. Number of respondents in each interval for each group are presented in table 3.1.

An index explaining time-delay to get the first job after completing studies was estimated for each field of specialization on educational qualifications difference basis i.e., undergraduate and graduate levels.

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[2] There is no undergraduate level in Engineering category as the BE degree is of 4 years, considered as equivalent to Masters by Higher Education Commission, Pakistan.

Table 3.1:   Number of Respondents in Each Group

Group	91-92	93-94	95-96	97-98	99-00	01-02	03-04	05-06	07-08
Engineering Undergraduates	20	20	20	20	20	20	20	20	20
Computer Science Graduates	4	6	11	20	17	20	20	19	20
Computer Science Undergraduates	12	14	16	20	18	20	18	20	20
Business Graduates	20	20	20	20	20	18	20	18	19
Business Undergraduates	12	17	20	20	20	20	20	20	20
General Graduates	20	20	20	20	20	20	20	20	20
General Undergraduates	16	20	20	14	19	20	20	20	20

The time-delay index "D" is estimated by the following formula.

$$D_j = (Max_j - Min_j) / (Max_a - Min_a)$$

(1)

where, "D_j" is an index that explains a relative delay in getting a job after completing studies.

Max_j => the maximum value of the delay for j category.

Min_j => the minimum value of the delay for j category.

Max_a => the maximum value of the delay for all categories.

Min_a => the minimum value of the delay for all categories.

Subscript "j" represent the fields of specialization mentioned above. Subscript "a" represent all specializations.

Finally we estimated equation (2) for each "j".

$$D_j = \alpha + \beta_j \, t + \varepsilon$$

(2)

where D_j is the time delay index, α is the intercept, β is the slope, t is time variable and ε error term. In equation (2) a negative β value means that time delay index (D) is decreasing over time which means labor market is showing signs of improvement in absorbing undergraduates and graduates.

4. Results

Table 4.1 shows the maximum and minimum delays for each specialization at undergraduate and graduate levels found from the entire time interval of 1991 to 2008. In actual values, the overall longest delay was found to be of undergraduates (BA) from general group, while the shortest delay was found to be zero for more than one group.

Converting these values into Z-Scores[3] , the overall longest delay was found to be in the discipline of graduates from computer science followed by graduates from general group. MS[4] engineering is identified with those who took study leave from the already acquired job after completing Bachelors of Engineering (BE), therefore the MS engineering group is not taken into account in this study.

Table 4.1:   Minimum and Maximum Delays 1991-2008

Engineering Graduates	Computer Science Graduates	Computer Science Under-Graduates	Business Graduates	Business Under-Graduates	General Graduates	General Under-Graduates
0	0	25	15	30	0	20
150	196	851	180	145	360	1080
-0.117	-5.091	-0.977	-0.386	-0.250	-3.677	-0.517
1.642	12.727	1.722	0.880	9.333	7.935	1.865

Engineers were found to be the best with least delay in getting absorbed by the market, while business graduates were second in ranking.

Thus for undergraduates & graduates of computer sciences and general groups the market's absorption capacity is found to be relatively low.

Table 4.2 shows the Z-score transformed values of the delay index for each of the nine intervals we have considered. During 1991 to 2008, the mean value shows engineers to be the group taking least the time in becoming part of the labor market, while business graduates remained

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[3] Z-Scores are calculated using the formula Z-Score = $(u – \bar{u}) / \sigma_u$, where u is the actual values, $\bar{u}$ is the mean of u and σ is Standard Deviation of series u.

[4] Normally MS Engineering is a program offered after completing four years engineering degree, where as undergraduate programs of other disciplines are normally of two years and for obtaining a graduate degree, two years more academia is required.

second. Undergraduates from computer science faced the worst delay with undergraduates from general group remaining second from the bottom of the list.

Table 4.3 shows cross-correlations of Z-score delay index among each group. Most of the correlation values were weak and negative, except for the case of engineering group; business graduates were 90 percent correlated and computer science graduates and undergraduates had correlation coefficient figuring at 74 percent.

Table 4.4 provides the OLS regression estimates for equation (2), which was recalled below.

$$D_j = \alpha + \beta_j \, t + \varepsilon$$
(2)

Negative beta values i.e., sign of convergence was found in cases of engineering group, graduates of business studies and graduates of general studies. The slope-coefficients for entire cases were found statistically significant at 10% level of significance. In all cases, we found no presence of autocorrelation problem. Although generally job opportunities in the field of engineering are relatively on the higher side, this study found that during the selected time period there have been some improvements in the labor market absorption capacity in graduates from business and general fields.

It is also found that in case of business graduates the convergence rate is highest. The respectable negative beta value of general group graduates seem to be influenced by the openings in TV and print media for graduates from mass communication and journalism.

Table 4.2:   Z score of Delay Index

	Engineering Graduates	Computer Science Graduates	Computer Science Undergraduates	Business Graduates	Business Undergraduates	General Graduates	General Undergraduates
91-92	-0.6821	-0.7404	-0.3124	-0.4622	0.6881	0.1713	0.0966
93-94	-0.7091	-0.7567	-0.5450	-0.4368	1.0572	0.4136	0.1464
95-96	-0.7410	-0.7594	1.4061	-0.6044	-0.4515	0.9538	0.0834
97-98	-0.7000	-0.7366	1.8184	-0.4792	-0.3343	-0.0327	1.0047
99-00	-0.7183	-0.7078	2.3127	-0.5359	-0.0914	-0.0483	0.3377
01-02	-0.7522	-0.6843	1.5909	-0.7357	-0.5482	-0.1865	0.7665
03-04	-0.6964	0.0126	3.1572	-0.5776	-0.4294	-0.5089	0.2526
05-06	-0.7716	-0.2010	2.8752	-0.7569	0.2068	-0.3089	0.5334
07-08	-0.7618	-0.2711	3.4139	-0.7471	1.3695	0.0059	0.9777
Mean	**-0.7258**	**-0.5383**	**1.7463**	**-0.5929**	**0.1630**	**0.0510**	**0.4665**
St. Dev.	**0.0300**	**0.2819**	**1.3333**	**0.1197**	**0.6732**	**0.4054**	**0.3698**

Table 4.3:   Correlation Matrix of Z-Scored Delay Index

	Engineering Graduates	Computer Science Graduates	Computer Science Undergraduates	Business Graduates	Business Undergraduates	General Graduates	General Undergraduates
Bachelor of Engineering	1						
Computer Science Graduates	-0.27	1					
Computer Science Undergraduates	-0.51	0.74	1				
Business Graduates	0.90	-0.52	-0.68	1			
Business Undergraduates	-0.06	0.05	-0.22	0.06	1		
General Graduates	0.02	-0.66	-0.55	0.32	0.13	1	
General Undergraduates	-0.05	-0.46	-0.34	0.09	0.43	0.29	1

Table 4.4: Convergence Tests for Delay Index

	Engineering Graduates	Computer Science Graduates	Computer Science Undergraduates	Business Graduates
α	-0.691	-0.881	-0.149	-0.440
(Prob.)	(0.000)***	(0.000)***	(0.691)	(0.000)***
β	**-0.007**	0.086	0.474	**-0.380**
(Prob.)	(0.046)**	(0.015)**	(0.000)***	(0.006)***
R^2	45%	62%	84%	68%
DW	2.94	1.87	2.33	3.3

Table 4.5: Convergence Tests for Delay Index

	Business Undergraduates	General Graduates	General Undergraduates
α	0.161	0.445	0.147
(Prob.)	(0.730)	(0.080)*	(0.476)
β	0.000	-0.090	0.079
(Prob.)	(0.000)***	(0.071)*	(0.094)*
R^2	0%	39%	34%
DW	1.09	1.82	2.7

* => significant at 10% level of significance.
** => significant at 5%,
*** => significant at 1%,

5. Conclusion and Recommendations

The key presumptions from our study are summarized as below:

Surprisingly, the longest delay was found to be in the discipline of graduates from computer science, but as expected the undergraduates and graduates from the general group showed little absorption capacity. On the other hand, engineers were found to be preeminent with least delay in getting the job. Business graduates were second specifically due to high market absorption capacity for those who major in marketing. Overall

there was weak correlation found across the selected specialized groups, except for engineering and business graduate group.

Our study shows that market absorption capacity in graduates from business and general fields has become healthier. In case of business graduates, a highest convergence rate is observed. Computer science graduates do not show good signs in building the labor market absorption capacity as the delay index of this group increases over time. General group – considered as underdogs – found satisfactory tendency to labor market joining capabilities particularly from the share of graduates from mass communication and journalism.

With such findings, a balanced educational policy can be crafted to pave the way for human resource development targets such that they must be accommodated in the labor market with least delay. A policy towards increasing the absorption capacity for all human capitalization objectives would also help in providing various areas of knowledge to get a balanced share in the job market.

With already high rate of unemployment in Pakistan, educational policies addressing the supply side of labor market are not enough. Mushroom growth in private sector universities with inadequate quality controls will not help in delay index to be reduced.

The labor market absorption capacity must also be enhanced by implementing import substitution strategies - e.g., via "Buy-Operate-Transfer" (BOT) basis - that build national capabilities and absorb human resource produced domestically. These developments transfer trickle-down effect in the economy by expansion of areas such as services and agriculture, thus raising the labor market absorption capacity through these specializations as well. In this regard, an unbiased and fair country-level credit distribution policy, primarily through micro-financing schemes, must be initiated that reaches the common man.

In Pakistan, the shortage of energy is alarming and now the negligence in this area has reached at a distressing stage. The energy shortage problem is the biggest barrier in any infrastructure capacity-building, and without addressing energy-related issues, the labor market absorption capacity cannot be improved.

One weakness of this study is that the survey was conducted only in Rawalpindi and Islamabad including the responses of 1168 participants. A comprehensive, nationwide research would be more relevant to effectively contribute towards guiding national educational policy and labor market absorption capacity.

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Appendix I

Questionnaire

1. Name: _____

2. Gender: Male _____   Female_____

3. Date of Birth: _____

4. Degree completed **BEFORE** the first career job:
    ___Undergraduate   ____Graduate

5. Field / Subject in which the first degree obtained:
    _Engineering   __Computer Sciences
    __Business Studies: (Finance, Economics, Marketing, HRM)
    __General: (Mass Communication, International Relations, Islamic Studies, Journalism etc)

6. Date of completing the degree: ____ Day _____ Month _____Year

7. You get the first career job on: _____Day _____ Month _____Year

8. Time lapsed to get the 1st career job after completing degree(s): _____ Days