

Farooq, Shujaat; Ahmed, Usman; Ali, Rehmat

## Article

# Education, underemployment, and job satisfaction

Pakistan Journal of Commerce and Social Sciences (PJCSS)

## Provided in Cooperation with:

Johar Education Society, Pakistan (JESPK)

*Suggested Citation:* Farooq, Shujaat; Ahmed, Usman; Ali, Rehmat (2008) : Education, underemployment, and job satisfaction, Pakistan Journal of Commerce and Social Sciences (PJCSS), ISSN 2309-8619, Johar Education Society, Pakistan (JESPK), Lahore, Vol. 1, pp. 83-91

This Version is available at:

<https://hdl.handle.net/10419/187982>

## Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

## Terms of use:

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<https://creativecommons.org/licenses/by-nc/4.0/>

## Education, Underemployment, and Job Satisfaction

Shujaat Farooq (Corresponding author)

Assistant Economic Adviser, Ministry of Finance, Government of Pakistan, Islamabad, Pakistan

Email: shjt\_farooq@yahoo.com

Usman Ahmed

Assistant Coordinator Officer, SNGPL, I-9, Islamabad, Pakistan

Email: rohanahmed2001@yahoo.com

Rehmat Ali

Staff Economist, Pakistan Institute of Development Economics, Islamabad, Pakistan

Real\_i\_1@yahoo.com

### Abstract

Education is an effective vehicle for producing the required skills to maintain economic growth. The benefits of education range from human to economic, social and cultural. In Pakistan, there is significant rise in the average level of education, but over time, more and more workers incapable to use their educational background on the job. Supply of labor may have outstripped the demand of labor in some professions, and high qualified peoples taking job on low positions. Such underemployment/overeducation has not been fully explored in Pakistan. The theme of paper is “underemployment symbolizes an inefficient usage of human resources and lost output for society”.

The research is based on case study on clerical workers of SNGPL. By comparing their educational backgrounds with their nature of job, this paper examines the impact of overeducation on job satisfaction. Our results show that underemployment/overeducation is correlated with higher level of job dissatisfaction, reduced job involvement, impaired co-worker relationship, and more emphasis on future aspirations.

**Keywords:** Sui Northern Gas Pipeline Limited (SNGPL), Job satisfaction, Underemployment, overeducated clerical workers.

### 1. Introduction

The economic role of human capital, particularly education has long been documented by economists and policy makers (Becker 1964). According to some observers view, educational system is an effective vehicle for producing the skills required to maintain growth in the economy (Ivar Berg, Education and Jobs: The Great Training Robbery (New York: Praeger Publishers, 1970). The versatile impact of education on every aspect of human existence makes it a vital area for policy framework especially for developing countries. Developing countries where majority of world's population resides need to maximize productivity and capabilities of the advanced human capital. The benefits of education range from human to economic, social and cultural. At human level, education contributes in attractive self esteem and confidence leading towards empowerment.

In Pakistan, there is significant rise in the average level of education, but over time, more and more workers incapable to use their educational background on the job. Two decades ago, it was judgment that supply of labor meeting the demand of labor. However in recent years, it is argued that supply of some skilled labor may have outstripped the demand of labor in some professions and high qualified peoples taking positions of low qualified peoples. Such underemployment/overeducation has not been fully explored in Pakistan.

The increasing supply of college and university educated workers has led some researchers to argue that higher education does not yield the economic returns to the degrees that it did just two decades ago. Today, some workers feel themselves that their attained education exceeds to the required education in a particular occupation. Furthermore, some workers have educational level far beyond others working in the same occupation; therefore the

skills of some highly educated group may be underutilized. Overeducated workers are defined as those whose educational attainments exceed to the requirements of education in a particular occupation.

The mismatch between education and job is an interesting issue from both theoretical and policy perspectives. From a theoretical perspective, many social scientists have argued that education is an important corridor to improve one's economic status, as education enhances earnings by increasing skills and productivity. From a policy point of view, there are two implications. First, may be there is too much societal emphasis on acquiring education, especially if the job market cannot accommodate such a large number of educated workers. 2<sup>nd</sup>, policy makers might consider the possible social implications resulting from such a numerous group of educated and dissatisfied.

A dominant paradigm in both sociology and economics suggests that surplus schooling does not always raise productivity and therefore will not always be rewarded with higher earnings (Duncan and Hoffman (1981) Rumberger 1987, Dolton and Vignoles (2000). There is evidence that underemployment is correlated with higher level of job dissatisfaction (Berg, 1970; Bisconti and Solmon, 1977) lower level of job involvement (Kalleberg and Sorensen, 1973), high job turn over rates and low level of productivity (Berg, 1970). There is a substantial amount of American and European empirical evidence on the topic of overeducation but unfortunately no such literature existing in Pakistan and in other developing countries. It is the intention of this study to fill this gap in the literature and investigate whether many empirical studies in developed economies hold for Pakistan or not.

The paper employs a job specific measure of over and undereducation based on the information provided by respondent themselves on the educational requirements to obtain their job. The paper examines the effects of overeducation on 82 low-level subordinate/clerical workers. The main focus of this study is the education-job mismatch. The paper investigates the relationship between overeducation and job satisfaction, job involvement, impaired co-worker relations and future aspirations.

The structure of the paper is organized as follows. Section II provides an overview of the main theoretical background of over education which enfold the description of overeducation, some conceptual theories and measurement of overeducation. Section III composed of literature review. Section IV provides some detail about data description and methodology. Section V contains the results and in the last section we offer some concluding comments.

## 2. Theoretical Background of Over and Under Education

**2.1 Definition:** Overeducated workers are defined as those whose educational attainments exceed to the requirements of education in a particular occupation. It can be seen as the decline in economic position of educated individuals relative to historically higher levels and underutilization of worker's educational skills (Tsang 1987). One may speak 'overqualification' when a person holds a job for which degree is not required, 'underqualification' when a person's educational attainment less than required education, and 'misallocation' when the education or training fails to correspond to the job held. Overeducation is a relative phenomenon. A person is defined as overeducated in one job may not be so defined in another job.

In the seventies decade, the wave of supply of fresh graduates in U.S. initiate the first research on overeducation. According to Freeman (1976), the overqualified workforce would trim down the return on education. To maintain the equilibrium in labor market, this low return should reduce the investment on higher education, overeducation was due to temporary disequilibrium in the labor market, but empirical evidence rejects this picture, because overeducation appears to be a lasting trait of the U.S. economy. But Freeman's prediction never materialized.

**2.2 Socioeconomic Background and Over-education:** In Pakistan, public sector employment is the preferred intention of the majority of university-educated workers. Education has expanded rapidly during the last two decades. Secondary enrollment level almost increased thirteen times from 1980 to 2005 and it led to a large increase in the demand for tertiary-level education. The education level of the Pakistan labor force also increase over time but still it is relatively low as compared with some other South Asian countries like India; China etc. There is high social demand for university education despite the fact that the monetary rewards associated with education, especially at the higher level, is very low in traditional subjects.

### 2.3 Is Over-education is Temporary or Permanent Phenomenon?

The conceptual problems in the literature are much significant. The exact meaning of the terms 'overeducation' and 'undereducation' have often depended on the assumptions made by the researcher about the workings of the labor market. Actually why overeducation exists at all, is an interesting question. According to **Human Capital theory**, it

is assumed that labor market is fully efficient, and every worker is paid the value of their marginal products. Productivity and wages are fixed in relation to perspective jobs; therefore overeducated workers have same productivity and receive the same wage levels as those workers who are in jobs with required level of education.

According to some social scientists, any increase in supply of educated labor should trim down the relative wage of such educated labor. In turn employer would now substitute the cheaper educated labor with less educated labor and capital. The low return may encourage worker to invest less on education. This adjustment in labor market implies that overeducation will be at most *short run phenomena*. Human Capital theory fails to explain the concept that some individuals are temporarily or permanently are in jobs where their skills are underutilized. Second one is **occupational mobility theory** (Rosen 1972; Sicherman and Galor 1990), over education represents a temporary phenomenon because overeducated workers are more readily promoted or more able to move to higher level jobs.

Third one is **job competition model** (Thurow 1975), marginal products and consequently earnings are associated with jobs, not individuals. Individuals are 1<sup>st</sup> allocated on jobs on the bases of personal characteristics, including education that guides the employers to measure the cost of training them to perform healthy on their jobs. Since this allocation is based on available supplies of both workers and jobs, workers may possess more education and skills than their jobs necessitate. Spence's (1973) developed **signaling model** or **job screening model**. According to this theory, there is imperfect information in the labor market and education is used as a signal to identify the more able, motivated, or productive workers. The basic signaling model therefore requires that the costs of education must be lower for higher ability workers.

The forth one is **assignment model** (Tinbergen 1956; Haratog 1981, 1985; Sattinger 1993) captured a more encompassing outlook. According to model; worker's salaries are determined in part by the job they are doing, particularly whether they are overeducated and in part by their human capital. An allocation problem exists in which workers differing in attributes are allocated jobs with differing levels of complexity. In a dynamic economy with heterogeneity of workers and jobs these frequency distributions are unlikely to match and mismatch will be a permanent feature of labor market.

## 2.4 Methods for Measuring Education and Skill Requirements

The prevalence of overeducation in the labor market is usually measured by comparing individuals' years of schooling with some indicator of the requirement of education in a particular occupation. To determine the required level of education for a job and the degree of overeducation and undereducation, three methods for measuring mismatch are implicit in the literature. They are as follow;

- Workers Self Assessment Criteria
- Expert's Evaluation
- Mean and Standard Deviation Criteria

### (1) Workers self assessment approach (Subjective approach):

The subjective measure refers to cases where workers report that they have acquired more schooling than their job allows them to utilize. To measure overeducation and misallocation, the subjective reports include questions such as "how much formal education is required to get a job like yours"? (Rumberger 1987; Duncan and Hoffman 1981). The estimates provide the basis for computing the total costs of educating a labor force with the desired level of skills. It may reflect the exact schooling required because it is based on an assessment of the actual job held by the incumbent. The method does not go uncriticised either.

This approach could be biased if job incumbents are more likely to report required schooling levels that more closely correspond to their actual level of education. In this case, the level of overeducation will be underestimated, which affects the validity. Further more respondents may not always have a good insight in the level of education required for a job (Cohn and Khan 1995, Halaby 1994)

### (2) Expert's evaluation (Objective Approach):

This method pertains to job analysts determining the level of education required for a job. In literature, this approach is based on the General Education Development (GED) scores available from the *Dictionary of Occupational Titles* (DOT) in U.S. The (GED) scores are designed to reflect skill requirements "typically" required for "satisfactory" job performance (Eckaus, 1964; Berg, 1970; Rumberger 1981). It derived independently of the job incumbent. Trained job analyst grades the jobs. It is unreliable as there may be no basis in reality for what certain workers believe to be

the case (Clogg and Shockey 1984). Moreover new technologies or forms of workplace organization leads to changes in educational requirements, DOT requirements from an earlier period may not reflect the requirement at a later period.

### (3) Mean plus Standard Deviation Approach:

Another approach tried to find the mismatch by two variables; years of schooling and occupation (Clog, 1979; Clog.C. C., Shackey W. J., 1984; Verdugo and Verdugo, 1989). The distribution of education is calculated for each occupation; employees who depart from the mean by more than some ad hoc value (generally one standard deviation) are classified as overeducation. Completed years of schooling are used as the proxy for educational attainment. This method ignores the variation in educational requirements within an occupation, while the limit of one standard deviation would also seem rather arbitrary (Halaby, 1994). This method is very sensitive to changes in labor market conditions. In case of excess supply of labor, employers will hire higher educated workers than is in fact required. Therefore it concludes that the method based on the realized matches is the least adequate one for determining overeducation and undereducation.

### 3. A Review of Literature

The accuracy of the match between a worker's education and his or her job has attracted the attention of economists over the last two decades. The main reasons for this interest is that education-job mismatches has relevant effects on the efficiency of the public and private investment in education by influencing wages as well as on other labor market outcomes such as job dissatisfaction and labor turnover (Hersch 1991). Berg (1970) used 1950 and 1960 Census data to discover "a drift of 'better' educated people into 'middle' level jobs". He also concludes that and increasing percentage of workers are employed in jobs that utilize less education than they possesses; that in many jobs experience is a better indicator of earnings than is education.

Freeman (1976) found that the proportion of male college graduates entering nonmanagerial and nonprofessional jobs increased from 14% to 31% in 1958 to 1971. Rumberger (1981), comparing 1960 and 1976 data, found that "the distribution of educational attainments.... shifted dramatically during this period": by 1976 less than 25 percent of the U.S. population had low-level education, but nearly half had jobs requiring low-level skills.

Berg et al. (1978) found that 51 percent of all college graduates and 24.8 percent of the entire U.S. labor force were underemployed in their present occupations. Norwood (1979), using Bureau of Labor Statistics data found that college graduates were increasingly entering the labor market as low-level workers, especially in clerical and sales positions. Sullivan (1978) and Clogg (1979) found that some workers are overeducated, suggesting that the skills of this highly educated group are being underutilized.

More subjective measures of underemployment also find the similar results that in U.S. workers felt that they were not utilizing their skills, they are overeducated for their jobs and that they lacked training opportunities etc (Bisconti and Solmon (1976), Duncan and Hoffman (1978, Staines and Quinn (1979)).

Some negative effects of underemployment also begun to explored. Advanced education, by raising workers' expectations for interesting and challenging work, is claimed to result in increased frustration and dissatisfaction when those expectations are not fulfilled. There is evidence that underemployment is correlated with higher level of job dissatisfaction (Berg, 1970; Bisconti and Solmon, 1977) lower level of job involvement (Kalleberg and Sorensen, 1973), high job turn over rates and low level of productivity (Berg, 1970).

Burris(1983) examined the effects of underemployment on 32 low-level clerical workers, comparing their educational backgrounds with their attitude and behaviors, and concluded that higher education produces increased job dissatisfaction, high turn over rates, reduced job involvement, impaired co-worker relations, and more emphasis on future aspirations. Using the data set of 12 manufacturing and warehouses firms. Hersch (1991), discuss the issues of surplus education, satisfaction, and turnover rates. The results supported the previous studies that overeducated workers were less satisfied to their jobs and have higher turn over rates. Battu et al (1997) also find similar results by using a survey of graduates from two cohort years (1985 and 1990) in United Kingdom.

### 4. Methodology and Data Description

#### 4.1 Hypothesis:

*"Overeducated workers are less satisfied with their jobs."*

The model is as follow;

$$\text{Satisfaction} = X_i + a_1 E^r + a_2 E^o + a_3 E^u + \ln W + \mu_i$$

Satisfaction is measured by ten point scale,  $\ln W$  is the logarithm of monthly wages,  $X$  is a row vector of control variables variable of individual  $i$  including experience, tenure, marital status, and nature of job (contract, permanent).

Subsequently the number of years of overeducation is determined on the basis of the level of education attained (in years) and the respondent's self reports about their level of education required. These two variables are constructed as follow. If  $E$  is the actual number of year of education and  $E^r$  is number of years of education required for a job, thus overeducation ( $E^o$ ) is represented by;

$$E^o = E - E^r \text{ if } E > E^r \text{ and}$$

$$E^o = 0 \text{ if } E \leq E^r$$

Similarly, the number of years of undereducation ( $E^u$ ) is determined as;

$$E^u = E^r - E \text{ if } E^r > E \text{ and}$$

$$E^u = 0 \text{ if } E^r \leq E$$

#### 4.2 Data and Empirical Specification varied

In 2007, we interviewed 82 clerical/subordinate male workers from the SNGPL Islamabad. We excluded from the sample those employed part time, or unemployed. The workers all held similar clerical jobs but had different educational backgrounds with age 20 to 50 years.

Clerical work is especially suitable for such investigation for three reasons. 1<sup>st</sup> Overeducation is high in the clerical sector due to traditional humanistic educational programs in Pakistan. 2<sup>nd</sup> overeducation in the lower white-collar sector are especially prone to job satisfaction. 3<sup>rd</sup> the paper analyze the utilization of skills in the public sector.

Questionnaire covers a wide range of topics including academic information, family background, job satisfaction, job involvement, co-worker relationship, quit intentions, on the job trainings, promotions and future aspirations. Respondents were also asked to evaluate their satisfaction with their degree and job. To obtain the data on the incidence of overeducation, the respondents were asked: "considering your education/skills, do you feel that you are overqualified for your job?" To obtain the required education for the job respondents were asked to state the minimum level of education which was required for the position they hold. **Satisfaction** is measured on a linear scale from zero to 10, where zero mean "not at all satisfied". **Skill utilization** is measured by offering a choice between the following response categories: less than 25%, 25%, 50%, 75%, and more than 75%. Quit Intention is a dummy variable equal to one if the worker responded that he is "very" or "somewhat likely" to make a genuine effort to find a new job within the next six months. On The Job Training is the response to the question. "Did the company provide any on the job training? If yes then how many weeks?" Additionally, the survey has time specific informations as respondents were asked to tell their previous employment situation. Finally a series of questions were asked about workers' general productiveness, and economic participation-month unemployed, amount of training and contractual status.

Table 1 provides a detailed overview of the variable definitions and sample characteristics for clerical workers

**Table 1: Description of Variables**

| variables                  | Operational Definition                                | Mean  |
|----------------------------|---|-------|
| Wage                       | = Monthly wage  | 13655 |
| Education Attainment       | = years of schooling completed                        | 15.25 |
| Required Education         | = years of schooling required to perform the job well | 12.3  |
| Surplus Education          | = attained education minus required education         | 2.95  |
| Percent Surplus Education  | = % of surplus education of total sample              | 0.70  |
| percent Adequate Education | = % of Adequate education of total sample             | 0.26  |



|                           |  |       |
|---------------------------|--|-------|
| Percent Undereducation    | = % of Undereducation of total sample  | 0.04  |
| Experience                | = years of full time work experience since age 18  | 13.52 |
| On the Job Training (OJT) | = Weeks of company provided on-the job training  | 9.12  |
| Satisfaction              | = ranking a job satisfaction on a scale 0 to10 from not at all satisfied   | 4.25  |
| Quit Intention            | = if a worker is somewhat or very likely to make a genuine effort to change employment in the next 6 months, 0 otherwise | 0.52  |
| Tenure                    | = years of tenure with present employer  | 8.32  |
| Married                   | = 1 if married ; 0 other wise  | 0.64  |
| Nature of job             | = 1 if worker has permanent job, 0 otherwise   | 0.62  |
| No of observation         | 82   |       |

## 5. Results

**5.1 Feeling of Overqualification:** To find out how much education constitutes overeducation for clerical work, we asked all respondents whether they felt overqualified for their jobs. Out of the sample 70% respondents reveal overqualification. Among post graduates, these feelings of overqualification grew from the sense that they had fine educational background but poor utilization of skills. They wanted to "try something different and more according to their education/skills."

According our results, young workers feel more overeducated as compare to old workers.

Thus, even though most of the graduate workers felt that the skills and knowledge they had acquired at school were not being used. They felt overqualified because their potential was not being fully used and their opportunities to learn and to grow on the job were limited. In the words of a 32-year-old computer operator: "I would like to do innovative. I know, education is very important, but I don't think that here people are utilizing their skills, and I feel that I don't necessarily have to have a degree for this job. I notice that there are lots of people sitting on top that don't have professional degrees".

Post graduate workers expressed similar feelings: they wanted to learn and grow on the job. They complained of a lack of training opportunities and an inability to learn about the overall operation of company. They complained that the specific content of what they had learned in education was not relevant to their job. There's a lot of frustration because there isn't the usage of the skills that were developed. Their work is more boring, more routine, less creative, and less autonomous.

**5.2 Job Dissatisfaction:** One of the various consequences accredited to overeducation, the one which receive the most support in this study is the association between overeducation and job dissatisfaction. Using the broadest possible definition of job dissatisfaction, approximately 57.5% of the total sample reported dissatisfaction with their present employment. This included 26.1% who were "very dissatisfied," 17% who were "little satisfied" and 14.4% who were only "moderately satisfied" with their work. Workers with too much education are less satisfied. None of the respondents with less than two years of college education expressed extreme dissatisfaction.

Table 2 presents the percentage of very satisfied workers to level of attained education. At the first glimpse, this table would seem to provide strong support for the hypothesis associated between overeducation and job dissatisfaction. It is evident that the very highest rates of job satisfaction are found among workers who are the most under qualified workers in terms of formal education. While the very low rate of job satisfaction are found among those who are the most overqualified.

**Table 2.**

| Level of Over-education | % Satisfied |
|-------------------------|-------------|
|-------------------------|-------------|

|     |      |
|-----|------|
| -1  | 84.9 |
| 0   | 62.8 |
| 1   | 45.7 |
| 2   | 37.5 |
| 3   | 27.6 |
| 3.5 | 21.8 |

Table 3 summarizes the results of the estimation of job satisfaction equation, where satisfaction is regressed on surplus, required and deficit education, as well as the remaining human capital variables and individual characteristics. The results show that overeducated workers are less satisfied and undereducated workers are more satisfied (significant at 5%). Satisfaction is not significantly related to required education. Workers with higher wages are more satisfied. Similarly permanent employees are more satisfied as compared to with contract workers

Table 3

Estimates of the impact of Educational mismatch on job Satisfaction

| variables          | coefficient | Standard error |
|--------------------|-------------|----------------|
| required education | 0.67        | 0.70506        |
| Surplus Education  | -0.351*     | 0.04033        |
| Deficit Education  | 0.051*      | 0.0509         |
| wage               | 0.073**     | 0.3442         |
| permanent          | 0.045*      | 0.0169         |
| No. of observation | 82          |                |
| R <sup>2</sup>     | 49%         |                |

\*Significant 5%, \*\* significant 1 %

Note: Equation also included the variables experience, tenure and marital status.

**5.3 Importance of Promotion and Aspiration for the Future:** Feeling of entitlement, combined with a sense of greater occupational options, made the higher educated workers more edgy. Since workers who change jobs often do so in response to higher outside wage offers, and attained education is most important determinant of outside wage offers than the required education in current job.

The post graduate workers were more likely to say “No” when asked, “Would you be content to stay in your present job for the foreseeable future?” 66% of this group, compared with 35% percent of those with four year college education, said “No.” the lesser educated felt they had fewer occupational options. A senior supervisor said, he deserves and like the promotion, but added “I don’t know when it will happen”; another said it’s hard to get a promotion in this company without approach”. A third respondent asked whether he would be content to stay in her present job, said “I may have no other choice.”

## 6. Conclusion

Overeducation is obviously a critical problem because it represents the wasteful investment of scarce resources. The overeducation is costly for the society and for the individuals. Existing approaches to overeducation are generally characterized by a technocratic orientation: the view that overeducation represents an “imbalance of the social machinery” (Squires 1979), a superficial dislocation of the social system which must be managed to make the



system function more smoothly. The hidden agenda of technocratic administrators is efficiency and productivity: "overeducation/underemployment represents an inefficient usage of human resources and lost output for the society" (Glyde 1977)

Our key conclusion is that:

- There is significant and genuine incidence of overqualification in clerical occupation (70% out of the sample).
- Overeducated workers are young as compared to old and possess more qualification as compared to old.
- There is little substantiation of widespread qualification inflation, i.e. employer systematically upgrading the educational requirements of jobs in response to the increase in the supply of more educated labor, without changing the job content.
- There has also been a substantial increase in the supply of more educated labor.
- The results confirm our hypothesis that individuals in jobs that underutilize their education and skills are dissatisfied because they earn almost no return on surplus education. Since the excess education that is not required and hence may be underutilized, have zero or lower impact on earning.
- Furthermore there is evidence that individuals who studied certain types of traditional humanistic subjects are more likely to be overeducated.

We did not focus on the determinants of over-education. The results here add support further empirical evidence supporting the view that the effect of education on satisfaction. Additional research and analysis is, of course, defensible, especially on such topics as how to measure overeducation, estimating the determinants and impact of overeducation on earning, job satisfaction, turn over, and on the job training. Research which undertakes such analysis in great detail than we have done here may be particularly fruitful.

### References

1. Belfield, B. H. C. and Sloane, P. (1999). Overeducation Among Graduates: A Cohort View. *Education economics*, 7, 21-38.
2. Becker, G. S. (1964). *Human Capital*. New York: National Bureau of Economic Research.
3. Berg, I. (1970) *Education and Jobs: The Great Training Robbery*. New York, Praeger Publishers.
4. Berg, I., Marcia, F. and Freeman, M. (1978). *Managers and Work Reform: A Limited Engagement*. New York: The Free Press.
5. Bisconti, A., and Lewis, S. (1976). *College Education on the Job: The Graduates' Viewpoint*. Bethlehem, Pa.: The CPC Foundation.
6. Burris, B. H. (1983). The Human Effects of Underemployment. *Social Problems*, 31(1), 96-110.
7. Clogg C. C. (1979). *Measuring Underemployment: Demographic Indicators for the United States*. New York: Academic Press.
8. Clog.C. C., Shockey W. J. (1984). Mismatch between Occupation and Schooling: A Prevalence Measure, Recent Trends and Demographic Analysis. *Demography*, 21(2), 235-257.
9. Cohn E., Khan S.P. (1995). The Wage Effects of Overschooling Revisited. *Labour Economics*, 2, 67-76.
10. Dolton, P. and Vignoles, A (2000). The Incidents and Wage Effects of Overeducation. *Economics of Education Review*, 19, 179-98.
11. Duncan G, and Hoffman S. (1978). The Economic Value of Surplus Education. pp. 233-246 in Greg Duncan and David Morgan (eds.), 5000 American Families, Volume 6. Ann Arbor, Mich.: Institute of Social Research.
12. Eckaus R. (1964). Economic Criteria for Education and Training. *Review of Economics and Statistics*, 46,181-190.
13. Freeman, R. B. (1976). *The Overeducated Americans*. New York: Academic Press.

14. Glyde, G. P. (1977). Underemployment: Definition and Causes. *Journal of Economic Issues*, 11(2), 245-261
15. Halaby C. N. (1994). Overeducation and Skill Mismatch, *Sociology of Education*, 67(1), 47-59.
16. Hartog Joop. (1985). Earnings Functions: Testing for the Demand Side. *Economics Letters*, 19, 281- 85.
17. Hersch J. (1991). *Education Match and Job Match*. University of Wyoming.
18. Kalleberg, A. and Sorensen A. (1973). The Measurement of the Effects of Overtraining on Job Attitudes. *Sociological Methods and Research*, 2(2), 215-238.
19. Norwood J. L. (1979). The Job Outlook for College Graduates Through 1990. *Occupational Outlook Quarterly*, Winter, 2-7.
20. Rosen S. (1972). Learning and Experience in the Labour Market. *The Journal of Human Resources*, 7 (3), 326-42.
21. Rumberger R. W. (1981). The Changing Skill Requirements of Jobs in the U.S. Economy. *Industrial and Labor Relations Review* 34 (4), 578-590.
22. Sattinger M. (1993). Assignment Models of the Distribution of Earnings. *Journal of Economic Literature*, XXXI, 831-880.
23. Sicherman, N. and Galor O. (1990). A Theory of Career Mobility, *Journal of Political Economy*, 98 (1), 169-92.
24. Spence M. (1973). Job Market Signalling, *Quarterly Journal of economics*, 87, 353-74.
25. Squires, G. (1979). *Education and Jobs: The Imbalancing of the Social Machinery*. New Brunswick, N.J.: Transaction Books.
26. Staines, Q. R. (1979). American Workers Evaluate the Quality of their Jobs. *Monthly Labor Review*, 102(1), 3-12.
27. Sullivan, T. M. (1978). *Marginal Workers, Marginal Jobs: The Underutilization of American Workers*. Austin: University of Texas Press.
28. Thurow, L. C. (1975). *Generating Inequality*. New York: Basic Books.
29. Tinbergen, J. (1956). On the Theory of Income Distribution. *Weltwirtschaftliches Archiv*, 77, 155-73.
30. Tsang, M. C. (1984). *The Impact of Overeducation on Productivity: A Case Study of Skill Underutilization of the U.S. Bell Companies*. IFG Program Report No. 84-B10. Stanford: Institute for Research on Educational Finance and Governance, Stanford University.
31. Verdugo, R. R. and Verdugo, N. T. (1989). The Impact of Surplus Schooling on Earnings: Some Additional Findings. *Journal of Human Resources*, 24(4), 629-643.