Productivity Effects of Overeducation in Germany —

A View from the Firm Side

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1. Introduction

In all industrialized countries, overeducation in the labor market is a persistent problem (for an overlook about this topic see e.g. Freeman 1976, Rumberger 1981). The phenomenon that many persons in the labor force have a qualification which is not required to perform their jobs causes various negative outcomes. A major effect is that the overall productivity of an economy is below the bounds of possibility set by the educational level of the working population.

In a micro-economic framework, there are two ways to measure productivity effects of overeducation.

The first approach focuses on the level of individuals. The lower productivity of overqualified workers can be detected in form of wage penalties. The standard research design is based on human capital theory. After splitting the human capital of workers into a component which is needed to perform the job (required education) and a "unused" one (surplus education), the returns for both components can be compared. Results from this approach are available for several countries. Almost all researchers report lower returns for the surplus education than for the required one. Nevertheless, the returns for surplus education are positive (see e.g. Duncan/Hoffman 1981, Hartog 1985, Rumberger 1987, Alba-Ramirez 1993, Kiker/Santos/de Oliveira 1997, Daly/Büchel/Duncan 1997). The presentation of a result with negative returns for the surplus education component by Verdugo/Verdugo (1989) was heavily criticized with regard to methodological problems of the Verdugo/Verdugo research design (see Cohn 1992, Gill/Solberg 1992); the reply of Verdugo/Verdugo (1992) could not convince.

Another approach to measure productivity effects of overeducation focuses on the level of firms. In the literature, mainly four main indicators are discussed. The expectation is that overqualified workers have - as a consequence of frustration tendencies - higher levels of job dissatisfaction, more health problems, as well as higher rates of absenteeism than correctly allocated workers (see section 2). In addition to that, they are expected to have higher turnover rates, due to frustration effects as well or because a job offer with a better match of formal qualification and job requirements arrives. In general, studies analyzing the mentioned dimensions of productivity confirm these hypotheses (see section 2). All these productivity effects measured on an individual level of course reduce the overall productivity of the firm which is employing overeducted workers.

Comparing the result patterns of those two different approaches, a somewhat confusing situation is given. On the one hand, overeducated workers get a (small) premium for the surplus component of their human capital. From the viewpoint of classic production theory, this signals that this component has at least some minor positive effect on productivity. On the other hand, firm focused studies claim that overeducated workers show deficits in various productivity relevant dimensions of work behaviour. Both patterns of results could only be consistent under the assumption, that firms are forced to hire applicants who are overqualified for the jobs to fill, e.g. due to restrictions of appropriate qualifications on the supply side. If this happens, firms could be forced to pay wages somewhat above the productivity output of the workers. However, because overeducated work is mainly observed in low skill jobs and low educated persons have the highest unemployment rates in all industrialized countries and therefore have a

weak bargaining position in the labour market, this explanation thesis does not seem to be very convincing. Therefore, the need for further research is obvious.

2.   Background

Empirical evidence about productivity effects of overeducation from firm focused designs has been available until now (with one exception, see below) only for the US. Main dimensions of interest are, as mentioned above, job satisfaction, health status, absenteeism and turnover. In addition to that, negative effects of overeducation are expected in some other dimensions of worker behaviour as e.g. drug use, industrial sabotage, and a higher motivation for strike activities. Specific analyses in the context of overeducation research was mainly done by Tsang (1987), Tsang/Rumberger/Levin (1991), Hersch (1991). Furthermore, numerous analyses in a weaker context to the topic of overeducation were presented mainly in the sixties and seventies, e.g. by Kornhauser (1964), Vroom (1964), Sheppard/Herrick (1972), Kasl (1974), House (1974), Coburn (1975), Mangione/Quinn (1975), and Quinn/Mandilovitch (1975). In general, authors confirm the hypothesis that overeducation affects workers behaviour in a negative way and therefore bears severe risks for firms (for an general overlook see Rumberger 1981, pp. 101ff. and, especially, Tsang/Levin 1985, pp. 96ff.).

For Germany, no representative analyses with firm oriented design are available until now. Published German research on the topic of overeducation strictly focuses on the negative outcomes for individuals (see e.g. Schwarze 1993, Plicht/Schober/Schreyer 1994, Büchel 1994, 1996, Büchel/Matiaske 1996, Büchel/Witte 1997, Daly/Büchel/Duncan 1997, Büchel/Weißhuhn 1997a,b,c,d). The only study which deals partly with firm specific productivity effects of overeducation is the one by Haugrund (1990). However, the fact that this work is a case study for a single firm and only focuses on specific occupational groups (technicians and engineers) makes it problematic to transfer its findings to the general situation in Germany.

Nevertheless, negative productivity effects of overeducation as presented by US authors are taken as given without hesitation in Germany, too. Overqualification is considered to be a major reason for rejection of job applicants. Consistent to that, Franz (1991) writes in his standard work for German labour economists: "Firms are hesitating for good reasons to hire overqualified workers, e.g. because an expected dissatisfaction of such an employee could affect negatively his/her productivity (...) and he/she could have a high intention to quit" (pp. 211f., translation by F.B.). Anyway: Already the formulation of this text block seems to show some reserve, and a source for his assertions is not presented by Franz - for good reasons, because there is no evidence available for Germany, neither in the field of personnel research nor in the classic field of labour market research. The analysis presented in this paper therefore is innovative for the German overeducation research.

3.   Data and Methods

Database and Case Selection

The empirical analysis is based on representative data from the German Socio-Economic Panel (GSOEP), directed by the German Institute for Economic Research (DIW) in Berlin. This ongoing dataset was started in 1984, when more than 12.000 individuals aged 16 or older were interviewed. Additional information for those people is collected every year with a nearly constant questionaire. The main purpose of the study is to obtain longitudinal information especially in the fields of educational and labour market behaviour (for more details, see Wagner/Burkha-user/Behringer, or, more specific, Projektgruppe Panel 1995). In this paper, the West German subsamples "A" (Germans) and "B" (immigrants) are analyzed. In the cross-sectional parts of the design, the 1995 data collection is used; in the longitudinal designs, the period from 1984 to 1995 is analyzed. The study is restricted on working people aged 16 to 65. Trainees and persons in education or formal training are excluded as well.

The Operationalization of Overeducation

To identify overeducation, a subjective approach is chosen. The data contains information about the formal vocational education of job-holders as well as a question about the formal education which is usually needed to perform the job. These two variables are taken to create an overeducation dummy variable. If the formal qualification is substantially higher than the qualification requirements of the job, the value of this variable is "overeducated: yes", else the value is "overeducated: no". Of course, the question raises what means "substantially". In the design of this study, this problem is strongly reduced, because only holders of low skill jobs are analyzed (see below). Those jobs are defined in this analyses by the fact, that no formal vocational training or a comparable qualification is needed. Therefore, persons who hold such a degree or a higher one (as e.g. an academic degree) and are performing low skill jobs are easily to classify as working overeducated. The construction of the overeducation dummy is validated by the additional information about the occupational position ("berufliche Stellung"). Some very few persons with inconsistent combinations of the three source variables are exluded from analysis (see Büchel/Weißhuhn 1997a for more details).

Dimensions of Productivity / Types of Jobs

In this analysis, the main dimensions of productivity observable with standard micro-economic datasets are analyzed: job satisfaction, health status, absenteeism and quit behaviour. In addition to that, participation in on-the-job training measures is analyzed, because this also affects the productivity potential of workers from the viewpoint of firms (for variable constructions and research designs of these steps of analyses see below).

To identify the effects of overeducation on productivity as precise as possible, the aim of this analysis is to keep the jobs, or their job demand levels, respectively, of the observed persons as similar as possible. Therefore, only persons working on low skill jobs which need no formal vocational qualification are analyzed.

Design of the different steps of analysis

All of the five dimensions of productivity are analyzed with a standardizised concept. In a first substep, descriptive information is broken down by overeducation status and sex. In a second substep, determinants affecting the dependent variable are presented. Dependent on the scale type of the dependent variable, OLS or Probit models (see Amemiya 1985) are used. For this purpose, a standard set of SES measures is entered as covariates in the models (for coding see footnote informations in tables). Job characteristics are considered to be endogenous and remain therefore controlled (an exception is made in the analysis of on-the-job training participation).

Job Satisfaction

The original GSOEP information about job satisfaction is available in a ordered scale from 0 ("absolutely dissatisfied") to 10 ("absolutely satisfied"). For better handling, this information is reduced to a dummy variable with the values "in tendency dissatisfied" (0-5) and "in tendency satisfied" (6-10).

Health Status

In the GSOEP, information about the health status of respondents is available in different forms. Previous research has shown that the question about the actual feeling has some validity problems, because the answers can be influenced by the conditions set by short-term circumstances. A more valid information is gained by the item with the following question "Apart from short-term illnesses: Does your health status hinder you when performing daily activities, as e.g. household work, paid work or educational activities? How much is it?". Answer categories are: "(1) not at all", "(2) somewhat", "(3) strongly" translation by F.B.). Pre-test about construct validity showed that the latter two values show up some similarities in its effects (the falling in one of these two categories could be influenced not only by objective health situation, but also by the character of persons), but show a strong difference to the first one. To create a (dependent) dummy variable for a binary probit model, the values (2) and (3) are merged to identify a weak health condition in mid- or long-term dimension.

Absenteeism

Absenteeism is not directly observable in standard data sets, of course (and probably is neither in special data sets). In this paper, a proxy construction is applied. The analyzed information is the number of working days lost due to

illness in the year preceding to the interview. It is obvious that this variable would not be a valid indicator for absenteeism if analyzed in an isolated form. Persons have different health conditions and therefore different risks to stay at home due to illness, and therefore a longer period of illness cannot be taken as an indicator for shirking. However, this fact can be taken into account by controlling the health status in the probit model. It is evident that this solution remains still unsatisfying, because the actual health status at time of interview is just a proxy for the health status during the one-year-period preceding the interview (which is usually taken in spring). Therefore, the results should be interpreted with some reservation. To enhance the validity of this approach, persons who had a work accident in the preceding year are excluded. Also, on persons who were working over the full observation period enter this step of analysis.

Firm tenure

The information about firm tenure in this step of analysis is not gained (as usual) by retrospective information. The reason is that with such a design the overeducation status at the beginning of a job spell, which is crucial for this analysis, would not be available. Therefore, longitudinal data is used. All persons who started a new (low skill) job in the period from 1984 to 1993 are part of the subsample in this step. Using the longitudinal information of the panel, they are distinguished into persons with a "short" firm tenure (less than 2 years) or a longer one. The reason for firm quit, i.e. whether influenced by decision of worker or firm, is not analyzed, because it has no effect with regards to the production of transaction costs for firms.

Participation in on-the-job training

Information about participation in on-the-job training measures was collected retrospectively for a 3-years-period in the waves of 1989 and 1993. Persons were asked to report information about the three most important training measures. The formulation of question makes it - in the light of the specific German training system - assumable that reported activities stand rather for continuing than initial training. Therefore, it is expected that the more productive employees are selected into those training measures by firm decisions. This assumption is confirmed by empirical evidence of various studies (see e.g. Büchel/Pannenberg 1994). To keep the training measures more homogenously, training activities which lasted less than one week are not considered. The variable analyzed in this step again is a dummy variable, which contains the information, whether a person performing a low skill job was selected in a on-the-job training measure during the observed 3-years period or not. The interview information from the waves of 1989 and 1993 are pooled. If a person was interviewed at both points of time, the 1989 information is used. Again, only persons who worked over the whole observation period are selected.

4.   Empirical Results

4.1   Job Satisfaction

The descriptive findings about the job satisfaction of workers in low skill jobs show different impacts of overqualification for men and women (Table 1A). Overeducated men are more satisfied with their work than correctly allocated men. A reverse pattern is found for women. This reverse situation could be explained by gender-specific motivations or needs to accept inattractive job offers, but also with gender-specific expectations about occupational work (see the results of the probit model below). The total column indicates that, on a highly aggregated level, there are no substantial differences in job satisfaction between overqualified and adequately qualified workers.

The results of the probit model (Table 1B) confirm the latter finding when controlling for important SES measures. Older worker tend to be more satisfied with their work. The same is true for people living in rural aeras. Both could be explained by strong differences in value perceptions between older and younger people as well as between residents in rural and more densely populated aeras. People with a poor health condition are less satisfied with their work, which is not surprising. This strong effect is probably due to the fact, that some of those people are forced to continue working for monetary reasons. Persons who state a low priority for their personal occupational success are much more dissatisfied than others. Again, we can observe an involuntary necessity to work rather than a "hedonistic" way of living. Pre-tests showed that a low priority given to occupational success is much more frequent reported by women than by men. This could explain why the gender effect is drawn from the sex dummy to this subjective variable.

The concluding remark from this step of analysis is that overeducation per se does not affect work satisfaction, when controlling for other personal characteristics and keeping the job demand level of analyzed jobs homogenous.

4.2   Health status

In low skill jobs, overeducated persons show a better health status than correctly allocated workers (Table 2A). This is specially true for men. This result could be explained by the fact, that the well known positive correlation between educational level and health status dominates the (as well known) positive correlation between job demand level (or working conditions, respectively), and health.

This result holds when controlling for important personal characteristics (Table 2B). The overeducation dummy causes the strongest effect of the model. The only other significant effect in the model confirms the well known fact that older workers have more health problems than younger.

The concluding remark from this step of analysis is that overeducated workers are in a better health condition than their colleagues, when controlling for other personal characteristics and keeping the job demand level of analyzed jobs homogenous.

4.3   Absenteeism

Overeducated workers in low skill jobs lose in average two days less working days per year due to illness than their correctly allocated colleagues (Table 3A). This result is caused by strong differences in the men's group, whereas among women nearly no differences between the two status groups can be observed.

However, the results from the regression model (Table 3B) show again that those strong behavioural differences between overeducated and correctly qualified working men are not caused by the pure status of overeducation, but by the fact, that persons with higher education (i.e. the overeducated, when keeping the job demand level constant) tend to have better health statuses. When explicitly controlling for the health status, which causes - not surprisingly - a very strong effect on days of illness, no significant effect for the overeducation dummy remains. As a minor result, the prejudice that foreigners tend to have a higher tendency to shirk than Germans can be confirmed at least at a 10% level of significance. However, it is known that foreigners have in general a weaker health condition than Germans as a result of assimilation problems, and the operationalization of the health dummy in this model is probably too inprecise to assure the mentioned common prejudice. Another minor result is the finding that a higher education reduces absenteeism; this holds again on a 10% level of significance.

The concluding remark from this step of analysis is that overeducation per se does not affect the intention for absenteeism, when controlling for other personal characteristics (especially health status and educational level) and keeping the job demand level of analyzed jobs homogenous.

4.4   Firm tenure

Overeducated workers in low skill jobs have a much lower tendency to leave the firm within a short period (less than 2 years) than their correctly allocated colleagues (Table 4A). The structure is observable among men as well as among women. This finding could be explained by the fact, that overeducated persons are "happy" to find at least a job, regardless of its quality, and an to work for an employer who did not reject the application for overqualification reasons.

The results from the probit model (Table 4B) confirm this finding when controlling for other personal variables. The effect is realized on a high significance level. The age effects show the well known fact that turnover is high among young workers. Also, older workers show high rates of turnover. This result could be caused by older people who already made use from attractive regulations of early retirement and who perform some irregular short-term jobs. Workers with the highest school degree (Abitur) tend strongly to work just for a limited time in a firm. This is caused

by the fact that holders of an Abitur degree (a certificate which allows access to university education) often perform irregular jobs in the meantime between of finishing shool and starting studies at university.

The concluding remark from this step of analysis is that overeducated workers have lower rates of short firm tenures than their colleagues, when controlling for other personal characteristics and keeping the job demand level of analyzed jobs homogenous.

4.5   On-the-job training

Overeducated workers in low skill jobs have a higher chance to be selected in qualified on-the-job training measures than their correctly allocated colleagues (Table 5A). The effect is stronger among men than among women. The well known fact that higher educated persons have higher training participation rates than other, which is due to the expectation of firms that better educated persons cause lower training costs then other, can therefore also be observed in low skill jobs.

This strong effect remains significant in the probit model when controlling for several other personal characteristics (Table 5B). The results for the other covariates, which are less interesting in the context of this analysis, show well known evidence. The best opportunities to be selected into training measures are given for the middle-aged workers, who have already some work experience. But later on, with growing age, the participation rate drops sharply. Persons with poor health conditions have lower chances to get further training, which is not surprising. Persons with the highest possible school degree (Abitur), but no academic degree (the Abitur variable used in the model is an interaction term for non-academics) have high participation rates in training measures. This pattern is consistent with the findings of Büchel/Bausch (1997), that an increasing number of Abitur degree holders reject their option to start studies at university and decide to start a non-academic working career, beginning at a low occupational level. Despite the lack of a missing vocational or academic degree, the qualified general school education gives them some advantages compared to other competitors. Finally, the earnings effect show that with increasing job level the need of training activities increases also in the low skill segment, and the effect caused by the year of observation shows that the frequency of training measures increased in the last few years.

The concluding remark from this step of analysis is that overeducated workers have higher rates of participation in on-the-job training measures than their colleagues, when controlling for other personal characteristics and keeping the job demand level of analyzed jobs homogenous.

5.   Conclusions

The findings of this paper showed that overeducated workers in German low skill jobs are not less productive than their correctly allocated colleagues. Concerning the productivity indicators of job satisfaction and absenteeism, there are no significant differences observable between those two groups. Concerning the productivity indicators of health

status, duration of firm tenure, and participation in on-the-job training, overeducated workers show an even more productive behaviour than adequately qualified colleagues in similar jobs.

This result pattern is not consistent with that presented in various US studies which believe to detect severe productivity losses caused by overeducation. The reason for this incongruence could be found in the differences of the approaches. The classic type of research design in this field merges most different types of jobs and qualifications of job-holders in a single model (see e.g. Hersch 1991). In such type of methodological framework, different effects of surplus qualification in respect to different job demand levels and different qualifications can not be identified.

For that reason, the main focus in this analysis was set on the purpose keeping the job demand levels as comparable as possible. The result gotten with this approach, i.e. an overall positive productivity effect of overeducation from the viewpoint of firms, is not only consistent with findings from most earnings analyses which evaluate a (small) positive income effect of surplus education on the individuals' level (see section 1). It can also give an answer for a major open question in overeducation research, namely why firms do hire overeducated workers in large numbers. The career mobility theory (Sicherman/Galor 1990) claims that overeducation at the beginning of a job has a function of a recruiting pool for in-firm promotions (see especially Sicherman 1991). This assumption could be tested with positive result for Germany in Büchel (1997, section 6.1.2). The only problem is, that the theory "works" also for correctly allocated workers. Therefore, the explanatory power of the theory concerning the firms decisions to hire overeducated persons is somewhat weakened. At the end, the overall result of this analysis is suiting to the expectations of the good old job-competition model (Thurow 1975): Higher educated persons are expected to be more productive (as shown in this paper) and get therefore positions at the upper end of the labor queue.

References

Alba-Ramirez, Alfonso 1993: Mismatch in the Spanish labor market: Overeducation? Journal of Human Resources, Vol. 28 (2), 259-278.

Amemiya, Takeshi 1985: Advanced Econometric Harvard University Press, Cambridge Mass.

Bodenhöfer, Hans-Joachim 1984: Unternehmenswachstum, Qualifikationsstruktur und Absorption eines höheren Qualifikationsangebot. In: Widmaier, Hans Peter (Ed.): Das Arbeitskräfteangebot zwischen Markt und Plan, Berlin, 11-60.

Büchel, Felix 1994: Overqualification at the Beginning of a Non Academic Working Career - The Efficiency of the German Dual System under Test. Konjunkturpolitik, Vol. 40 (3-4), 342-368.

Büchel, Felix 1996: Der hohe Anteil an unterwertig Beschäftigten bei jüngeren Akademikern: Karrierezeitpunkt- oder Strukturwandel-Effekt? Mitteilungen aus der Arbeitsmarkt- und Berufsforschung, Vol. 29 (2), 279-294.

Büchel, Felix 1997: Zuviel gelernt? Ausbildungsinadäquate Erwerbstätigkeit in Deutschland, habilitation thesis at the Department of Economics at Technical University of Berlin, forthcoming at W. Bertelsmann publishers, Bielefeld.

Büchel, Felix and Bausch, Thomas 1997: Karriereoptionen von Abiturienten. Eine Analyse der Verdienst- möglichkeiten in Abhängigkeit unterschiedlicher Ausbildungspfade. In: Beicht, Ursula, Berger, Klaus, Herget, Hermann, and Krekel, Elisabeth M. (Eds.): Berufsperspektiven mit Lehre. Wert und Zukunft dualer Berufsausbildung-Beiträge aus Berufsbildungswissenschaft und -praxis, Vol. 211 of Serie "Berichte zur Beruflichen Bildung" of the Federal Institute for Vocational Training Affairs (BIBB), Berlin and Bonn, 247-262.

Büchel, Felix and Matiaske, Wenzel 1996: Die Ausbildungsadäquanz der Beschäftigung bei Berufsanfängern mit Fachhoch- und Hochschulabschluß. Konjunkturpolitik, Vol. 42 (1), 53-83.

Büchel, Felix and Pannenberg, Markus 1994: On-the-Job Training, innerbetriebliche Karrierepfade und Einkommensentwicklung. Jahrbücher für Nationalökonomie und Statistik, Vol. 213 (3), 278-291.

Büchel, Felix and Weißhuhn, Gernot 1997a: Ausbildungsinadäquate Beschäftigung der Absolventen des Bildungssystem Berichterstattung zu Struktur und Entwicklung unterwertiger Beschäftigung in West- und Ostdeutschland. Report on behalf of the Federal Ministry of Education, Science, Research and Technology (BMBF). Vol. 471 of Serie "Volkswirtschaftliche Schriften" of Duncker & Humblot publishers, Berlin.

Büchel, Felix and Weißhuhn, Gernot 1997b: Ausbildungsinadäquate Beschäftigung der Absolventen des Bildungssystem Fortsetzung der Berichterstattung zu Struktur und Entwicklung unterwertiger Beschä- ftigung in West- und Ostdeutschland: Berichtszeitraum 1993-1995. Report on behalf of the Federal Ministry of Education, Science, Research and Technology (BMBF). Forthcoming as Vol. 471/1 of Serie "Volkswirtschaftliche Schriften" of Duncker & Humblot publishers, Berlin.

Büchel, Felix und Weißhuhn, Gernot 1997c: Ausbildungsinadäquate Beschäftigung in Deutschland und den USA. Ein Vergleich von Struktur und Einkommenseffekten auf der Basis von Paneldaten. Report on behalf of the Federal Ministry of Education, Science, Research and Technology (BMBF), Brochure, edited by BMBF, Bonn.

Büchel, Felix und Weißhuhn, Gernot 1997d: Ausbildungsinadäquate Beschäftigung von Frauen in West- und Ostdeutschland: Arbeitsbedingungen und sozio-ökonomische Bestimmungsgründe. Report on behalf of the Federal Ministry of Education, Science, Research and Technology (BMBF). W. Bertelsmann publishers, Bielefeld.

Büchel, Felix and Witte, James C. 1997: The Incidence and Consequences of Overeducation Among Young Workers in the United States and Germany: A Comparative Panel Analysis. In: Dunn, Thomas A. and Schwarze, Johannes (Eds.): Proceedings of the 1996 Second International Conference of the German Socio-Economic Panels Study Users. Special issue of Vierteljahrshefte zur Wirtschaftsforschung, Vol. 66 (1), 32-40.

Coburn, D. 1975: Job-worker ingruence: consequence for health. Journal of health and social behavior, Vol. 16, 198-212.

Cohn, Elchanan 1992: The Impact of Surplus Schooling on Earnings: Comment. The Journal of Human Resources, Vol. 27 (4), 679-682.

Daly, Mary C., Büchel, Felix, and Duncan, Greg J. 1997: Premiums and Penalties for Over- and Undereducation: Cross-time and Cross-national Comparisons in the United States and Germany, in: Dunn, Thomas A. and Schwarze, Johannes (Eds.): Proceedings of the 1996 Second International Conference of the German Socio-Economic Panels Study Users. Special issue of Vierteljahrshefte zur Wirtschaftsforschung, Vol. 66 (1), 25-31.

Duncan, Greg J. and Hoffmann, Saul D. 1981: The Incidence and Wage Effects of Overeducation. Economics of Education Review, Vol. 1 (1), 75-86.

Franz, Wolfgang 1991: Arbeitsmarktökonomik. Berlin etc.

Freeman, Richard B. 1976: The Overeducated American, New York etc.

Gill, Andrew M. and Solberg, Eric J. 1992: Surplus Schooling and Earnings: A Critique. The Journal of Human Resources, Vol. 27 (4), 683-689.

Hartog, Joop 1985: Earnings Functions: Testing for the Demand Side. Economics Letters, Vol. 19, 281-285.

Haugrund, Stefan 1990: Qualifikationsreserven in der industriellen Forschung und Entwicklung. Eine empirische Untersuchung zur Häufigkeit und zu ausgewählten Folgen einer arbeitsplatzbezogenen, individuellen Überqualifikation. Vol. 6 of Serie "Management von Forschung, Entwicklung und Innovation", ed. by Brockhoff, Klaus and Domsch, Michel, Stuttgart.

Hersch, Joni 1991: Education Match and Job Match. Review of Economics and Statistics, Vol. 79, 140-144.

House, J. 1974: The effects of occupational stress on physical health. In: O'Toole, J. (Ed.): Work and the Quality of Life. Cambridge, Mass., 145-170.

Kasl, 1974: Work and mental health. In: O'Toole, J. (Ed.): Work and the Quality of Life. Cambridge, Mass., 171-196.

Kiker, Billy Frazier, Santos, Maria C., and Oliveira, M. Mendes de 1997: Overeducation and undereducation: Evidence for Portugal. Economics of Education Review, Vol. 16 (2), 111 - 125.

Kornhauser, A. 1965: Mental Health of the Industrial Worker. New York.

Mangione, Thomas W. and Quinn, Robert P. 1975: Job Satisfaction, Counterproductive Behavior, and Drug Use at Work. Journal of applied Psychology, Vol. 60, 114-116.

Plicht, Hannelore, Schober, Karen, and Schreyer, Franziska 1994: Zur Ausbildungsadäquanz der Beschäftigung von Hochschulabsolventinnen und -absolventen. Versuch einer Quantifizierung anhand der Mikrozensen 1985 bis 1991. Mitteilungen aus der Arbeitsmarkt- und Berufsforschung, Vol. 27 (3), 177-204.

Projektgruppe Panel 1995: Das Sozio-oekonomische Panel (SOEP) im Jahre 1994. Vierteljahrshefte zur Wirtschaftsforschung, Vol. 64 (1), 5-15.

Quinn, R. and Mandilovitch, M. 1975: Education and Job Satisfaction: a Questionable Payoff. Ann Arbor, Michigan.

Rippe, Wolfgang 1984: Die Analyse von betrieblichen Entscheidungsprozessen bei der Nachfrage von Hochschul-absolventen. Ein zu Recht vernachlässigter Ansatz bei der Erforschung von Absorptionsmechanismen des Arbeitsmarkts? In: Widmaier, Hans Peter (Ed.): Das Arbeitskräfteangebot zwischen Markt und Plan, Berlin, 61-96.

Rumberger, Russel W. 1981: Overeducation in the US. Labor Market, Verlag, New York.

Rumberger, Russel W. 1987: The Impact of Surplus Schooling on Productivity and Earnings. Journal of Human Resources, Vol. 22 (1), 24-50.

Schwarze, Johannes 1993: Qualifikation, Überqualifikation und Phasen des Transformationsprozesse Die Entwicklung der Lohnstruktur in den neuen Bundesländern. In: Jahrbücher für Nationalökonomie und Statistik, Vol. 211 (1-2), 90-107.

Sheppard, Harold L. and Herrick, Neal Q. 1972: Where Have All the Robots Gone: Worker Dissatisfaction in the 70s. New York.

Sicherman, Nachum 1991: "Overeducation" in the Labor Market. Journal of Labor Economics, Vol. 9 (2), 101-122.

Sicherman, Nachum und Galor, Oded 1990: A Theory of Career Mobility. Journal of Political Economy, Vol. 98 (1), 169-192.

Thurow, Lester C. 1975: Generating Inequality. Mechanisms of Distribution in the U.S. Economy. New York.

Tsang, Mun C. 1987: The Impact of Underutilization of Education on Productivity: A Case Study of the U. Bell Companies. Economics of Education Review, Vol. 6 (3), 239-254.

Tsang, Mun C. und Levin, Henry M. 1985: The Economics of Overeducation. Economics of Education Review, Vol. 4 (2), 93-104.

Tsang, Mun C., Rumberger, Russell W., and Levin, Henry M. 1991: The Impact of Surplus Schooling on Worker Productivity. Industrial Relations, Vol. 30 (2), 209-228.

Verdugo, Richard R. and Turner Verdugo, Naomi 1989: The Impact of Surplus Schooling on Earnings: Some Additional Findings. The Journal of Human Resources, Vol. 24 (4), 629-643.

Verdugo, Richard R. und Turner Verdugo, Naomi 1992: Surplus Schooling and Earnings: Reply to Cohn and to Gill and Solberg. The Journal of Human Resources, Vol. 27 (4), 690-695.

Vroom, V. 1964: Work and Motivation. New York.

Wagner, Gert, Burkhauser, Richard V., and Behringer, Friederike 1993: The English Language Public Use File of The German Socio-Economic Panel. Journal of Human Resources, Vol. 28 (2), 429-433.

Table 1A: Job satisfaction of persons in low skill jobs, by overeducation status and sex

(West Germany, 1995)

Shares of persons with low job satisfaction (in %) 1).

	Men	Women	Total
	%	%	%
Overeducation status:			
not overeducated	37	24	29
overeducated	26	34	30
Total	30	28	29

n of cases:	344	381	725
	289	251	540

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

1) Value between 0 and 5 on a scale from 0 ("absolutely dissatisfied") to 10 ("absolutely satisfied").

Only working people aged 16-65.
Without trainees and persons in education or formal training.
Without migrants from East Germany after 1989.
Without immigrant subsample "D" of GSOEP.

Weighted frequencies; unweighted number of cases.

Source: Own calculations from the German Socio-Economic Panel (GSOEP).

Table 1B: Effects of overeducation on job satisfaction of persons in low skill jobs (West Germany, 1995, Probit)

Covariates:	coeff.	(std-err)	mean
constant	-1.259	(0.594)	-
man	-0.019	(0.079)	0.50
age (years)	0.041	(0.027)	40.87
age**2(/100)	-0.055+	(0.033)	18.06
foreigner	-0.039	(0.107)	0.51
married 1)	-0.112	(0.095)	0.73
poor health status 2)	0.661**	(0.084)	0.32
Hauptschule degree 3)	-0.117	(0.101)	0.46
(Realschule degree) 4)	.	(.)	.
Abitur 5)	0.339	(0.264)	0.02
occup. success has no importance 6)	0.335**	(0.128)	0.11
regional unemployment rate 7)	-0.006	(0.020)	8.53
rural area 8)	-0.173*	(0.087)	0.60
overeducated 9)	-0.061	(0.084)	0.43

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n of cases (unweighted):	1253
Log-Likelihood:	-683.8
Likelihood-Ratio-Statistic:	101.0**

Mean of dependent variable (weighted):	0.292

Dependent variable: 1 = low job satisfaction (Value between 0 and 5 on a scale from 0 ("absolutely dissatisfied") to 10 ("absolutely satisfied"); 0 = (value from 6 - 10).

Levels of significance: **: p < 0.01, *: p < 0.05, +: p < 0.10.

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

Footnotes:
1) Including living together with partner.2) Health status hinders "somewhat" or "strongly" in performing daily activities.3) (Lower secondary school-leaving certificate). 4) (Intermediate school-leaving certificate); including "Fachabitur".5) (Upper secondary leaving certificate; giving access to higher education). 6) "To have occupational success" is "less important" or "not important at all". Term of interaction with German nationality (item was not asked among foreigners).7) On the level of "Raumordnungsregion", supplied by BfLR, based on place of residence.8) City size < 50.000 inhabitants. 9) i.e. persons with vocational degree or academic degree (in low skill jobs). Alternative status: correctly allocated workers (i.e. persons without any formal vocational or academic degree).

Covariates in parentheses = reference categories.

Unweighted means of covariates as a documentation.

Only working people aged 16-65.
Without trainees and persons in education or formal training.
Without migrants from East Germany after 1989.
Without immigrant subsample "D" of GSOEP.

Source: Own calculations from the German Socio-Economic Panel (GSOEP).

Table 2A: Health status of persons in low skill jobs, by overeducation status and sex

(West Germany, 1995)

Shares of persons with poor health status (in %) 1).

	Men	Women	Total
	%	%	%
Overeducation status:			
not overeducated	36	38	37
overeducated	27	35	31
Total	31	37	34

n of cases:	357	405	762
	294	264	558

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

1) Health status hinders "somewhat" or "strongly" in performing daily activities.

Only working people aged 16-65.
Without trainees and persons in education or formal training.
Without migrants from East Germany after 1989.
Without immigrant subsample "D" of GSOEP.

Weighted frequencies; unweighted number of cases.

Source: Own calculations from the German Socio-Economic Panel (GSOEP).

Table 2B: Effects of overeducation on health status of persons in low skill jobs

(West Germany, 1995, Probit)

Covariates:	coeff.	(std-err)	mean
constant	-1.958	(0.575)	-
man	-0.058	(0.076)	0.49
age (years)	0.053*	(0.026)	40.77
age**2(/100)	-0.026	(0.031)	18.01
foreigner	-0.001	(0.106)	0.50
married 1)	-0.038	(0.092)	0.73
Hauptschule degree 3)	-0.024	(0.099)	0.46
(Realschule degree) 4)	.	(.)	.
Abitur 5)	-0.017	(0.255)	0.03
occup. success has no importance 6)	0.114	(0.121)	0.12
regional unemployment rate 7)	-0.014	(0.019)	8.53
rural area 8)	-0.011	(0.082)	0.60
overeducated 9)	-0.185*	(0.081)	0.42

n of cases (unweighted):	1306
Log-Likelihood:	-761.1
Likelihood-Ratio-Statistic:	130.6**

Mean of dependent variable (weighted): 0.340

Dependent variable: 1 = Health status hinders "somewhat" or "strongly" in performing daily activities.; 0 = ... "not at all".

Levels of significance: **: $p < 0.01$, *: $p < 0.05$, +: $p < 0.10$.

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

Footnotes:
1) Including living together with partner.3) (Lower secondary school-leaving certificate). 4) (Intermediate school-leaving certificate); including "Fachabitur".5) (Upper secondary leaving certificate; giving access to higher education). 6) "To have occupational success" is "less important" or "not important at all". Term of interaction with German nationality (item was not asked among foreigners).7) On the level of "Raumordnungsregion", supplied by BfLR, based on place of residence.8) City size < 50.000 inhabitants. 9) i.e. persons with vocational degree or academic degree (in low skill jobs). Alternative status: correctly allocated workers (i.e. persons without any formal vocational or academic degree).

Covariates in parentheses = reference categories.

Unweighted means of covariates as a documentation.

Only working people aged 16-65.
Without trainees and persons in education or formal training.
Without migrants from East Germany after 1989.
Without immigrant subsample "D" of GSOEP.

Source: Own calculations from the German Socio-Economic Panel (GSOEP).

Table 3A: Working days lost due to illness of persons in low skill jobs, by overeducation status and sex (West Germany, 1995)

Means of working days lost due to illness in the preceding year of interview 1).

	Men	Women	Total
	mean	mean	mean
Overeducation status:			
not overeducated	15.9	9.3	11.8
overeducated	10.6	9.0	9.8
Total	13.3	9.2	11.0

n of cases:	276	308	584
	149	149	298

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

1) Question: "How many working days did you miss at your working place last year due to illness?"

Only people with firm tenure of at least 2 years.

Without persons who suffered an occupational accident in 1994 which required medical treatment or a hospital stay.

Only working people aged 16-65.
Without trainees and persons in education or formal training.
Without migrants from East Germany after 1989.
Without immigrant subsample "D" of GSOEP.

Weighted frequencies; unweighted number of cases.

Source: Own calculations from the German Socio-Economic Panel (GSOEP).

Table 3B: Effects of overeducation on working days lost due to illness of persons in low skill jobs (West Germany, 1995, OLS)

Covariates:	coeff.	(std-err)	mean
constant	1.628+	(0.845)	-
man	0.112	(0.100)	0.48
age (years)	-0.033	(0.038)	42.67
age**2(/100)	0.038	(0.044)	19.41
foreigner	0.260+	(0.142)	0.55
married 1)	0.042	(0.124)	0.78
poor health status 2)	1.046**	(0.107)	0.33
Hauptschule degree 3)	0.160	(0.134)	0.44
(Realschule degree) 4)	.	(.)	.
Abitur 5)	-0.570+	(0.353)	0.02
occup. success has no importance 6	-0.259	(0.167)	0.12
regional unemployment rate 7)	-0.014	(0.025)	8.47
rural area 8)	0.135	(0.108)	0.60
overeducated 9)	-0.087	(0.110)	0.34

---

n of cases (unweighted):	872
R2adj.	.11
F-value	10.3**
Mean of dependent variable (weighted):	1.306

Dependent variable: Log (working days lost due to illness in the preceding year of interview + 1). 10)

Levels of significance: **: $p < 0.01$, *: $p < 0.05$, +: $p < 0.10$.

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

Footnotes:
1) Including living together with partner.2) Health status hinders "somewhat" or "strongly" in performing daily activities.3) (Lower secondary school-leaving certificate). 4) (Intermediate school-leaving certificate); including "Fachabitur".5) (Upper secondary leaving certificate; giving access to higher education). 6) "To have occupational success" is "less important" or "not important at all". Term of interaction with German nationality (item was not asked among foreigners).7) On the level of "Raumordnungsregion", supplied by BfLR, based on place of residence.8) City size < 50.000 inhabitants. 9) i.e. persons with vocational degree or academic degree (in low skill jobs). Alternative status: correctly allocated workers (i.e. persons without any formal vocational or academic degree).10) Question: "How many working days did you miss at your working place last year due to illness?"

Covariates in parentheses = reference categories.
Unweighted means of covariates as a documentation.

Only people with firm tenure of at least 2 years.
Without persons who suffered an occupational accident in 1994 which required medical treatment or a hospital stay.

Only working people aged 16-65.
Without trainees and persons in education or formal training.
Without migrants from East Germany after 1989.
Without immigrant subsample "D" of GSOEP.

Source: Own calculations from the German Socio-Economic Panel (GSOEP).

Table 4A: Firm tenure of persons in low skill jobs, by overeducation status at date of firm entry and sex (West Germany, 1984-1995)

Shares of persons who left firm within a period of 2 years (in %).

	Men	Women	Total
	%	%	%
Overeducation status:			
not overeducated	45	36	39
overeducated	28	25	26
Total	35	30	32

n of cases:			
	392	485	877
	368	392	760

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

Only persons who realized a firm change in the period of 1984-1995.

Only working people aged 16-65.
Without trainees and persons in education or formal training.
Without migrants from East Germany after 1989.
Without immigrant subsample "D" of GSOEP.

Weighted frequencies; unweighted number of cases.

Source: Own calculations from the German Socio-Economic Panel (GSOEP).

Table 4B: Effects of overeducation (at date of firm entry) on firm tenure of persons who started in low skill jobs (West Germany, 1984-1995, Probit)

Covariates:	coeff.	(std-err)	mean
constant	1.910**	(0.419)	-
man	-0.041	(0.071)	0.44
age (years)	-0.123**	(0.023)	33.81
age**2(/100)	0.147**	(0.032)	12.80
foreigner	-0.126	(0.084)	0.15
married 1)	-0.020	(0.084)	0.51
poor health status 2)	-0.023	(0.080)	0.29
Hauptschule degree 3)	-0.001	(0.076)	0.62
(Realschule degree) 4)	.	(.)	.
Abitur 5)	0.802**	(0.184)	0.05
occup. success has no importance	-0.043	(0.118)	0.18
regional unemployment rate 7)	0.005	(0.011)	7.86
rural area 8)	-0.076	(0.072)	0.58
overeducated 9)	-0.198**	(0.072)	0.56

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n of cases (unweighted):            1569
Log-Likelihood:                     -915.2
Likelihood-Ratio-Statistic:         181.2**

Mean of dependent variable (weighted):   0.321
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Dependent variable: 1 = firm change within a period of 2 years; 0 = longer firm tenure.

Levels of significance: **: $p < 0.01$, *: $p < 0.05$, +: $p < 0.10$.

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

Footnotes:

1) Including living together with partner.2) Health status hinders "somewhat" or "strongly" in performing daily activities.3) (Lower secondary school-leaving certificate). 4) (Intermediate school-leaving certificate); including "Fachabitur".5) (Upper secondary leaving certificate; giving access to higher education). 6) "To have occupational success" is "less important" or "not important at all". Term of interaction with German nationality (item was not asked among foreigners).7) On the level of "Raumordnungsregion", supplied by BfLR, based on place of residence.8) City size < 50.000 inhabitants. 9) i.e. persons with vocational degree or academic degree (in low skill jobs). Alternative status: correctly allocated workers (i.e. persons without any formal vocational or academic degree).

Only persons who realized a firm change in the period of 1984-1995.

Covariates in parentheses = reference categories.

Unweighted means of covariates as a documentation.

Only working people aged 16-65.
Without trainees and persons in education or formal training.
Without migrants from East Germany after 1989.
Without immigrant subsample "D" of GSOEP.

Source: Own calculations from the German Socio-Economic Panel (GSOEP).

Table 5A: Participation in on-the-job training of persons in low skill jobs,

by overeducation status and sex (West Germany, 1987-1989 and 1991-1993, pooled)

Shares of persons who participated in a preceding 3-years period in on-the-job training measures with a duration of at least 1 week (in %) 1).

	Men	Women	Total
	%	%	%
Overeducation status:			
not overeducated	3.3	3.6	3.5
overeducated	8.0	4.9	6.5
Total	5.8	4.2	5.0

n of cases:	572	570	1142
	426	356	782

1) Observation periods: 1987 - 1989 for persons of interview 1989 or 1991 - 1993 for persons of interview 1993 who did not participate in the 1989 interview, respectively.

Only persons in low skill jobs who were working over the whole observation period.

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

Only working people aged 16-65.
Without trainees and persons in education or formal training.
Without migrants from East Germany after 1989.
Without immigrant subsample "D" of GSOEP.

Weighted frequencies; unweighted number of cases.

Source: Own calculations from the German Socio-Economic Panel (GSOEP).

Table 5B: Effects of overeducation on participation in on-the-job training of persons in low skill jobs (West Germany, 1987-1989 and 1991-1993, Probit)

Covariates:	coeff.	(std-err)	mean
constant	-5.445**	(1.533)	-
man	-0.001	(0.159)	0.52
age (years)	0.194*	(0.081)	40.87
age**2(/100)	-0.298**	(0.110)	17.96
foreigner	-0.431*	(0.194)	0.51
married 1)	-0.113	(0.176)	0.74
poor health status 2)	-0.425*	(0.186)	0.39
Hauptschule degree 3)	-0.010	(0.176)	0.46
(Realschule degree) 4)	.	(.)	.
Abitur 5)	0.939*	(0.392)	0.02
occup. success has no importance 6	0.181	(0.210)	0.13
regional unemployment rate 7)	-0.004	(0.035)	6.89
rural area 8)	-0.022	(0.162)	0.57
relative work experience 9)	0.492	(0.418)	0.88
firm tenure (years)	-0.004	(0.015)	10.32
earnings /100 10)	0.012+	(0.007)	27.42
year: 1993 11)	0.320+	(0.176)	0.28
overeducated 12)	0.341*	(0.157)	0.41

n of cases (unweighted): 3006
Log-Likelihood: -1256.0
Likelihood-Ratio-Statistic: 564.5**

Mean of dependent variable (weighted): 0.159

Dependent variable: 1 = person participated in a 3-years period preceding to interview in an on-the-job training measure which took at least 1 week; 0 = (no participation).

Levels of significance: **: p < 0.01, *: p < 0.05, +: p < 0.10.

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

Footnotes:
1) Including living together with partner.2) Health status hinders "somewhat" or "strongly" in performing daily activities.3) (Lower secondary school-leaving certificate). 4) (Intermediate school-leaving certificate); including "Fachabitur".5) (Upper secondary leaving certificate; giving access to higher education). 6) "To have occupational success" is "less important" or "not important at all". Term of interaction with German nationality (item was not asked among foreigners).7) On the lev*' of "Raumordnungsregion", supplied by BfLR, based on place of residence.8) City size < 50.000 inhabitants. 9) Calculation for observable preceding biography: years of work / years (part-time work = factor 0.5). 10) gross monthly earnings in DM (full-time equivalent), deflated (1985=100). 11) Alternative status: year of interview = 1989. 12) i.e. persons with vocational degree or academic degree (in low skill jobs). Alternative status: correctly allocated workers (i.e. persons without any formal vocational or academic degree).

Observation periods: 1987 - 1989 for persons of interview 1989 or 1991 - 1993 for persons of interview 1993 who did not participate in the 1989 interview, respectively.

Only persons in low skill jobs who were working in 1989 or 1993, respectively, in low skill jobs and worked over the whole observation period.

"low skill jobs": no formal vocational training (or higher) needed to perform the job.

Covariates information gained in 1989 or 1993, respectively.

Covariates in parentheses = reference categories.
Unweighted means of covariates as a documentation.

Only working people aged 16-65.
Without trainees and persons in education or formal training.
Without migrants from East Germany after 1989.
Without immigrant subsample "D" of GSOEP.

Source: Own calculations from the German Socio-Economic Panel (GSOEP).