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EMPLOYERS' DEMAND FOR QUALIFICATIONS AND SKILLS

Increased merit selection in Austria, 1985–2005

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ABSTRACT: The paper attempts to empirically test skill demand on the Austrian labour market between 1985 and 2005 by making use of job advertisements. We analyze job advertisements covering a time span of 20 years. This allows us to examine whether there is a trend towards increased merit selection. Our empirical research is based on a content analysis of 975 newspaper job advertisements. We expand on the operationalization of education by looking at both educational level and field of study. Results indicate that jobs described in advertisements increasingly demanded various types of skill. Besides educational merits, other types of skills are also relevant in modern-day economies: social and personal skills. It is demonstrated that the driving force in changing demands is not only compositional change (with the expansion of high-skill demanding jobs), but also changes within occupational groups.

Key words: content analysis; employment skills; occupational groups

1. Introduction

Modernization theory predicts a move 'from ascription to achievement' in the social mobility patterns in modern (post-) industrial societies (Davis and Moore 1945; Parsons and Shils 1951; Blau and Duncan 1967; Treiman 1970; Bell 1972; De Graaf and Luijckx 1993). Ascribed characteristics relating to social origin are expected to have become less important, whereas achieved characteristics such as education have gained in relevance. Modernization theory argues that it is no longer effective to recruit on the basis of social background characteristics. Instead, employers increasingly select on the basis of individual achievements (skills, formal

qualifications). Jonsson (1992) labelled this latter process the Increased Merit Selection (IMS) hypothesis.

So far the IMS hypothesis has mostly been tested using survey data, looking at the impact of social origin on educational and occupational attainment of children, and the impact of educational qualifications on occupational (or class) attainment (but see e.g., Bills 1990; Petersen *et al.* 2000 for interesting studies of the demand side). There are two shortcomings with such an analysis. First, because survey data on employees are analyzed, no information is available on the behaviour of employers. Given the fact that employers are the ones who are believed to have changed their selection behaviour to the benefit of individual merit, a rigorous test of the IMS hypothesis requires data among employers. Secondly, survey-based research usually focuses on formal educational qualifications as indicator of merit, and excludes other relevant components of skill. Therefore, an assessment of the relevance of social or personal skills is hardly ever made. Given the growth of the number of service sector jobs, it is essential that tests of the IMS hypothesis take account of a wider understanding of skills as usually seen.

One way to avoid these problems in analyzing 'increased merit selection' has recently been introduced, by making use of job advertisements (Jackson 2001; Moelker 1992; Jackson *et al.* 2005; Sacchi *et al.* 2005). By looking at job advertisements published in British newspapers in 1999, Jackson's research has been able to analyze the demands of employers for particular types of skills, including formal qualifications and other skill types. However, although Jackson's work allows for an interesting analysis of the extent of merit selection (or merit preferences of employers displayed in job advertisements), she has not been able to analyze *trends* in the extent to which employers demand particular skill types or formal qualifications. Thus, whether there is a trend towards *increased* merit selection is something that could thus far not be answered using personnel advertisements.

Therefore, the present research aims to test empirically the IMS hypothesis and assess job requirements over a period of 20 years. The main objective is to examine trends regarding the demand for education and other skill types. This will be done by analyzing the content of job advertisements in three daily Austrian newspapers in 1985, 1990 and 2005.

2. Theoretical background

2.1. The increased merit selection hypothesis

Modernization theory predicts a move from ascription to achievement in modern industrial societies, referring to the replacement of social

background characteristics by individual achievements. Due to educational expansion, free access to education and cultural/normative change, the association between social class origin and education is expected to have weakened over time. At the same time, companies require the best and most productive employees and cannot afford anymore to fill vacancies on the basis of ascription. Therefore, it is assumed that employer's recruitment practices have changed by increasingly relying on educational qualifications.

The outcome of the propositions of modernization theory would be an efficient 'meritocratic' society in which individuals' achievements are matched to their capabilities and where rewards are caused by educational qualifications for productive reasons. The term 'merit' has been introduced by Michael Young (1958), whose well-known definition equates it with '*IQ + effort*'. A meritocracy in its initial conception referred to an elite that founds its legitimacy from their achievement associated with intelligence, together with effort. The hypothesized increase in achievement in terms of formal qualifications, together with a decline in ascription is called the increased merit selection (IMS) hypothesis (Jonsson 1992). The increased merit selection hypothesis states that there is a trend in post-industrial societies towards recruitment and reward on the basis of formal qualifications.

Although most of the empirical research on merit selection focuses on education, and sometimes cognitive skills, more recently a wider conception of skill has been proposed. Looking for an explanation of *decreasing* (rather than increasing) impact of education on class attainment shown by several studies, this literature considers the expansion of the service sector crucial (Goldthorpe 1997; Breen and Goldthorpe 2001; Jackson *et al.* 2005). Modernization not only increased the number of 'high-tech' occupations demanding education and cognitive skills, but in particular the number of 'high-touch' occupations where soft skills are more relevant (Jackson *et al.* 2005; Jackson 2007). This means that the productive capacities of job seekers (i.e., merits) are defined by employers, and can hardly be summarized by indicators that scholars have thus far used for it (Goldthorpe 1997). Merit is thus no longer synonymous with achievement, as it could also be affected by social background. However, for such attributes to be called merits, Kingston (2006) notes that these should not only enhance job performance across diverse groups of workers, but also be weakly or not at all related to social background.

2.2. What are merits?

It is not straightforward whether the non-educational, non-cognitive skills mentioned above can be defined as merits (Goldthorpe 1997; Jackson *et al.*

2005; Kingston 2006). On the one hand, Jackson (2007) adopts a conventional view on the definition of merits, and equates merits with educational qualifications, cognitive skills, and effort. Her analysis on job advertisements therefore distinguishes merit from non-merit factors, the latter including, e.g., social and personal skills. On the other hand, Kingston (2006) adopts a much wider definition of merits, where merits are attributes that are related to productivity, unrelated to ascriptive factors (such as social class, gender or ethnicity), and affecting career success across demographic groups. Obviously social skills could fall under the definition of Kingston, as long as they are unrelated to social background, whereas social skills were purposefully left out of the definition of merits in Jackson's work. Kingston's definition is appealing because it excludes attributes that are related to ascription which could yet be productive capacities. If, for example, ethnicity would affect job performance (for example if salesmen from ethnic majority populations would sell more than ethnic minority salesmen), ethnicity would not qualify as a merit, even if employers would select on it for productive reasons only. Yet, given that our design (relying on data on job advertisements) does not allow studying the impact of ascriptive factors, we adopt the narrower definition of Jackson and distinguish between merit and non-merit attributes.¹

3. Educational and non-educational merits: hypotheses

Conceptually and empirically we distinguish between three types of skill demand: (i) education (level and field), (ii) cognitive abilities not necessarily obtained in education, and (iii) social and personal skills.

3.1. Education

The first merit component of importance is evidently education. Within this domain, there has been a single-sided focus on the demand for a particular educational *level*. The decreasing impact of educational level on social class achievement has led a number of researchers to conclude that the

1. A potential problem with Kingston's definition is that also conventional indicators of merit (e.g., educational qualifications, cognitive skills) are strongly affected by social background. Kingston argues that such variables could indicate merit because their impact on labour market outcomes is unaffected by the inclusion of social background in the regression equation.

increased merit selection hypothesis is falsified (Breen and Whelan 1993; Jonsson 1996; Breen and Goldthorpe 2001; Vallet 2001; Whelan and Layte 2002; Ganzeboom and Luijkx 2004; Goldthorpe and Mills 2004). Without a broader understanding of education, this conclusion seems somewhat premature. We should also look at other educational aspects than level of schooling. Therefore, we expand on the operationalization of education by looking at the demand for vocational and general educational qualifications, as well as at the demand for specific fields of study. More fine-grained differentiations in education may have become increasingly relevant in a labour market that is too highly educated for the existing occupational structure. In their search for personnel, employers therefore need more educational signals than its level alone, and will increasingly demand particular educational fields of study. This leads to the following hypotheses:

H1: Job advertisements increasingly demand for particular vocational educational qualifications, especially for skilled working class jobs.

H2: Job advertisements increasingly demand for tertiary-level educational qualifications, especially for managerial and professional jobs.

H3: Educational field of study is increasingly mentioned in job advertisements across the period 1985–2005, especially for professional occupations.

3.2. Cognitive and technical qualities

Through job advertisements we can also observe changes in demand for skills that are not necessarily obtained in schooling, but certainly related to it. Examples of such attributes are analytical skills and intelligence, but also technical job skills and computer skills. In general it is expected that demand for such cognitive qualities has increased over time. We coded cognitive skills as prevalent whenever a job advertisement requested characteristics such as analytical skills, intelligence, quick perceptive faculty, and the ability to learn new things from potential employees. Technical skills refer to a technical knowledge and in the occupational group of clerical workers to the ability of being good in typing.

H4: Cognitive qualities are increasingly demanded in job advertisements across the period 1985–2005, especially for professional occupations.

3.3. Social and personal skills

Besides education and cognitive skills, other types of skill are also relevant in modern-day economies: social and personal skills. Job advertisements state a number of variables that are not necessarily related to education, but certainly valued by employers. Among them are communication skills, teamwork, autonomy, leadership, flexibility, job commitment, mobility, stress resistance and language skills. These variables were coded dichotomously in terms of whether these skills are demanded or not by employers.

Communication skills refer to excellent rhetoric skills, as well as to being sociable and having etiquettes. Teamwork skills refer to the ability of job seekers to cooperate with others and work in teams. It is expected that these often called ‘soft skills’ are increasingly demanded by employers. Part of this trend will be caused by changes in the occupational structure, particularly the expansion of the service sector. Yet, we also expect an increase in the demand for soft skills within job categories, especially in service occupations. This leads to the following hypothesis:

H5: Social and personal skills are increasingly demanded in job advertisements across the period 1985–2005, in particular for service occupations.

3.4. Compositional changes or changes within occupations?

An important issue with regard to trends in demand for skills of various types is whether trends are driven by the changing composition of the occupational structure, or whether changes are also to be expected within occupational groups. To take an example: if we observe an increasing demand for qualifications, is this caused by the fact that an increasing proportion of advertised jobs are jobs for which formal qualifications have always been important, such as in management and the professions? Or would we observe changes even within occupational groups? It seems that Jackson *et al.* (2005) argue that the driving force in changing demands is really compositional change. For example, one important reason for stressing the increased relevance of social and personal skills is the ‘rapid growth’ of ‘people occupations’ (Jackson *et al.* 2005: 13).

However, it seems likely that also within occupational groups, trends as expected in hypotheses 1–5 are to be found. Not only have complex jobs increased and simple jobs contracted in Western economies; within jobs an increasing job complexity is observed (e.g., Gallie *et al.* 1998). This increased complexity would call for increased demands for formal educational qualifications and non-educational cognitive qualities. With regard to social and personal skills it is relevant that modern human

resource management increasingly focuses on team work and recruits increasingly on personal and social skills of applicants (Lengnick-Hall and Lengnick-Hall 1988; Hendry and Pettigrew 1990). This would imply that also within occupations an increasing emphasis on social and personal skills in the recruitment process is to be expected. This leads to the following hypothesis:

H6. The changing occupational structure will not fully account for changing demand for the various skill types. That is; for similar occupations demands have changed in line with hypotheses 1–5.

4. Research design

The empirical analysis presented here is based on a content analysis (Krippendorff 1980) of 975 job advertisements printed in Austrian newspapers in 1985, 1990 and 2005. Three large daily newspapers are subject of the study.² For each newspaper, the weekend edition of the second week in September was chosen for the years 1985, 1990 and 2005, respectively. By choosing advertisements from one single month we rule out the impact of seasonal variations. The uneven choice of years results from the interest to compare the present day focus on social skills to two earlier periods where education was thought to be the most dominant selection criterion.³

The use of personnel advertisements for tracing skill demand is not without problems. First, not all vacancies are advertised, making for a bias towards more highly skilled occupations in advertisements.⁴ However, there are no indications that this systematically varies across time. Second, the question arises whether the skills that are listed in personnel advertisements are really required by employers, or instead function as publicity for the company. However, qualitative interviews with British employers indicated that their advertisements really mentioned the types

2. Newspapers were: der Kurier (62 percent of advertisements), der Standard (16 percent, only 1990 and 2005), and die Presse (22 percent). Distribution across years is 26 percent in 1985, 32 percent in 1990, and 42 percent in 2005.

3. Note that our linear specification of a time trend would also be warranted with equal intervals, but the data were initially gathered for a project that purposefully aimed to compare the present with two periods in the past.

4. Research by the Public Employment Service Austria ('Arbeitsmarktservice') has shown that especially high-skilled jobs are published in newspapers, whereas jobs demanding lowest qualifications (compulsory education or even no education) are mostly advertised on the website of the 'Arbeitsmarktservice' (Kostera 2006). Since these job descriptions are not archived, we could not include them in our empirical analysis.

of skill they need (Jackson 2001). Third, studying *trends* using personnel advertisements could be difficult if the percentage of vacancies that are advertised correlates to macro-economic circumstances. For instance, if unemployment is high, employers may not need to publish a costly advertisement to find personnel, as many job seekers may send in unsolicited application letters. It seems plausible that particularly high-skill job advertisements will remain to be advertised in times of high unemployment. As the Austrian unemployment rate was 3.6 percent in 1985, 3.2 percent in 1990, and 5.2 percent in 2005 (OECD 2006), a distributional change in the types of occupations that are advertised could be due to the relatively high unemployment rate in 2005. Therefore, an analysis of job advertisements in order to trace increased merit selection should always be seen in the context of other data material, e.g., online job advertisements.⁵ Fourthly, changes in job advertisements may not necessarily reflect changes in selection, but more in the broader recruitment processes. For instance, job advertisements may increasingly be used to define the target group of job seekers, whereas the final selection on individual characteristics could remain unchanged.

Given these limitations, testing the IMS hypothesis should not be limited to using job advertisements. Yet such a design opens up essential additional knowledge on the relevance of different types of skills for several reasons. First, advertisements highlight the requirements by employers (i.e., the demand side of the labour market), which is a useful addition to data mostly available for the supply side only. Second, analyzing job advertisements gives the advantage that we can trace historical data without limitations of other types of data that can only be gathered at a particular point in time (such as surveys). Third, there is no problem of ‘non-response’ often afflicting survey research – although obviously the skill bias in advertisements can be seen as a systematic non-observation of low skilled demand as well.

4.1. The Austrian context

Since the empirical analysis is based on data for Austria, we will briefly describe the Austrian institutional context which is relevant in connection with skill demand.

5. The increasing importance of the internet has changed the face of job advertising, with some jobs and sectors mainly being advertised on the web. A quantitative analysis of the Austrian job market represented in job advertisements of 2005 has shown that most online advertisements target white collar and service sector occupations (Kostera 2006).

The Austrian educational system can be characterized by a strong vocational orientation, similar to Germany. After completion of compulsory schooling, many young people enrol into apprenticeship training.⁶ This usually has the form of a 2–4-year vocational training in more than 250 disciplines, which combines theoretical vocational education with on-the-job training in a company. Consequently, occupationally specific qualifications are relatively important in the labour market, and employers rely on these certificates when recruiting personnel. Therefore, we can expect that trends in Austria regarding the importance of certificates might differ from trends in the UK reported by Jackson (2001).

Apart from the educational system, another feature of the Austrian context needs to be discussed in relation with skill demand – the share of small and medium-sized firms. The Austrian economy is characterized by a large share of small and medium-sized firms. Since internal labour markets are weaker the smaller the company size (Althausen 1989), we can expect that the share of jobs being advertised represents an appropriate share of the total skill demand.

5. Descriptive statistics

We classified jobs into the nine main occupational categories of the Austrian version of the International Standard Classification of Occupations (ISCO-88) developed by the International Labour Organisation. Table 1 displays the distribution of job advertisements by occupational group and year.

The job advertisements of this study mainly fall into the first five occupational groups: managerial jobs with 16.6 percent of the total sample, professional occupations that require an academic degree (18.4 percent), technical jobs (11.6 percent), clerical jobs (28.3 percent) and service occupations (21.1 percent). Category six, which refers to skilled jobs in agriculture, forestry and fishery, does not contain any of the 982 job advertisements. Also categories seven, eight and nine do not contain many advertisements. This could be explained with high financial costs of printed job advertisements: because advertising jobs in newspapers and magazines is a costly method of searching for employees, employers search for high skilled employees and expect returns on their investments.⁷

6. About 40 percent of all pupils of 1 year enrol into apprenticeship training. *Source:* Arbeitsmarktservice Österreich.

7. Occupational categories VIII and IX have been excluded from the quantitative analysis because they contain too few cases; therefore, the analysis is based on 975 job advertisements

TABLE 1. Distribution of advertisements by occupational group and year

Occupational group	Title	% in sample 1985	% in sample 1990	% in sample 2005	% in population 2005 ^a	% of total
I	Managerial jobs	16.9	15.4	17.3	13.4	16.6
II	Professional jobs	14.2	16.4	22.7	9.8	18.4
III	Technicians	15.0	10.7	10.2	20.8	11.6
IV	White-collar workers	26.0	37.7	22.4	12.5	28.3
V	Service sector occupations	18.5	16.7	26.1	13.1	21.1
VI	Farming and fishery	0	0	0	5.2	0
VII	Manual skills jobs	7.9	2.2	1.2	13.8	3.3
VIII	Machine operators	0.4	0.3	0	6.6	0.2
IX	Unskilled workers	1.2	0.6	0	10.5	0.5
						100

^aEstimated from the Austrian Mikrozensus (2005).

Within the group of educational qualifications, we coded advertisements as to whether any qualification was demanded, whether a tertiary educational qualification was demanded, whether a vocational qualification was demanded, and whether a specific field of study was demanded.⁸ Vocational education has been divided into four categories in the original data file: upper secondary level vocational education, lasting between 3 and 5 years and leading to a vocational degree; tertiary level vocational education, so-called *Fachhochschulen*; apprenticeship training, a dual form of schooling plus training on the job following the completion of compulsory schooling; and additional vocational qualifications as a fourth category (e.g., accountancy examination, a diploma in pharmaceuticals).

Figure 1 shows the trends in the demand for educational qualifications over time. Vocational educational qualifications were increasingly demanded over the period ($\chi^2[2] = 4.40$, $P > 0.05$).

A particular field of study has been mentioned in 25 percent of all job advertisements from 1985; the corresponding numbers for 1990 and 2005 are 22 and 32 percent, respectively ($\chi^2[6] = 15.81$, $P < 0.05$). With regard to a particular field of study, there are differences among the fields that are required: employers seem to value a degree in economics, business and law

8. Although compulsory education has initially been coded, it has been excluded from the statistical analysis because no job advertisement required compulsory education.

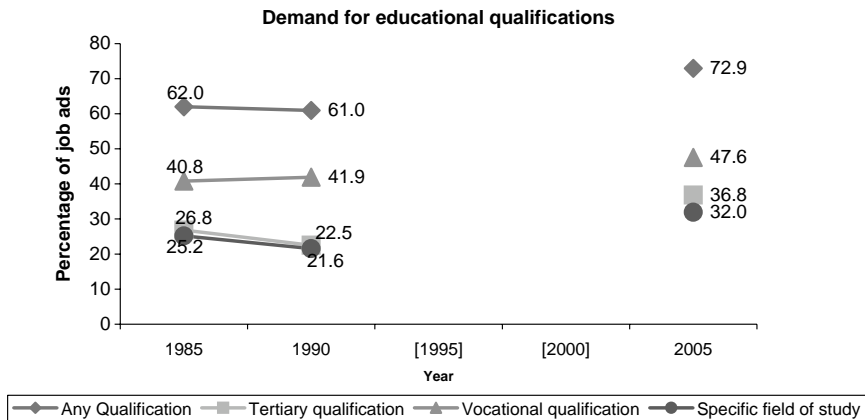


Figure 1. Trends in demand for formal educational qualifications in newspaper job advertisements, Austria

(13 percent of overall advertisements) over technical, science and health (11 percent), and humanities and social sciences (2.5 percent).

Figure 1 also shows trends in the general demand for any qualification (either vocational, general or field of study). In total, 66 percent of all advertisements demand some form of educational qualification. In 2005, 73 percent of the overall job advertisements made a reference to education, while the corresponding numbers for 1990 and 1985 are 61 and 62 percent, respectively ($\chi^2[2] = 15.98, P < 0.05$). This result is in line with the hypothesis that educational qualifications (or meritocratic characteristics) are gaining in importance in the recruitment process. Interesting is the comparison of the result presented here with that of Jackson (2001): in her sample of British job advertisements from 1999, she found that only 42 percent of all advertisements contained requirements for formal qualifications. It seems that educational qualifications are much more often demanded in Austrian job advertisements than in British ones.

Figure 2 displays trends in the demand for communication skills and teamwork. In 2005, communication skills are the most important social skills asked for by employers. They are required in almost 54 percent of job advertisements. The demand for them rose significantly between 1990 and 2005 from 27 to 54 percent ($t = 7.478, P < 0.05$); it was relatively stable in the period before ($t = 0.391, P > 0.05$), with 26 percent in 1985 and 27 percent in 1990.

The ability to work in teams and cooperate with others is the second most frequently mentioned social skill in job advertisements from 2005, and its prevalence is increasing in importance in today's organizations. While this skill has only been required in 8 percent of job advertisements

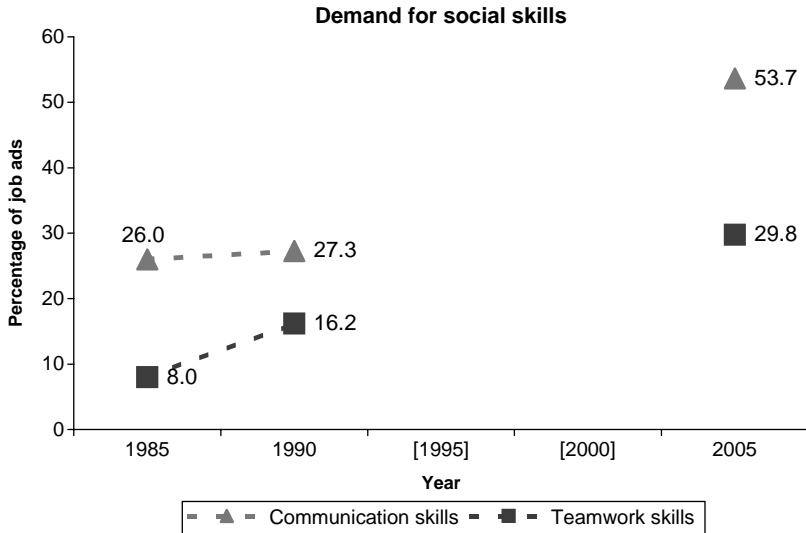


Figure 2. Trends in demand for social skills in newspaper job advertisements, Austria

from 1985, it rose up to 16 percent in 1990 and furthermore to 30 percent in 2005 ($\chi^2[2] = 51.45$, $P < 0.05$).

Figure 3 shows how the demand for cognitive skills, technical skills and IT skills has developed over time. Cognitive skills increasingly appear in job advertisements throughout the period of research: demanded in 8 percent of job advertisements from 1985, the corresponding numbers for 1990 and 2005 are 13 and 15 percent, respectively ($\chi^2[2] = 7.16$, $P < 0.05$). Regarding technical skills, which contain technical understanding and the ability to type, we can observe a decreasing importance in recruitment: while these skills have been required in 35 percent of job advertisements from 1985, their frequency accounts for 24 percent in 1990 and 17 percent in 2005 ($\chi^2[2] = 29.60$, $P < 0.05$). It seems that they have been replaced by ICT skills; the demand for them increased from 13 percent in 1985 to 40 percent in 2005 ($\chi^2[2] = 60.53$, $P < 0.05$).

6. Multivariate models

In this section, we will test the hypotheses formulated above using logistic regressions. We will focus on time trends over the period of 20 years as regards the role of three types of merit (education, cognitive abilities, social and personal skills) in the recruitment process. We will first test whether educational qualifications are gaining in importance across time

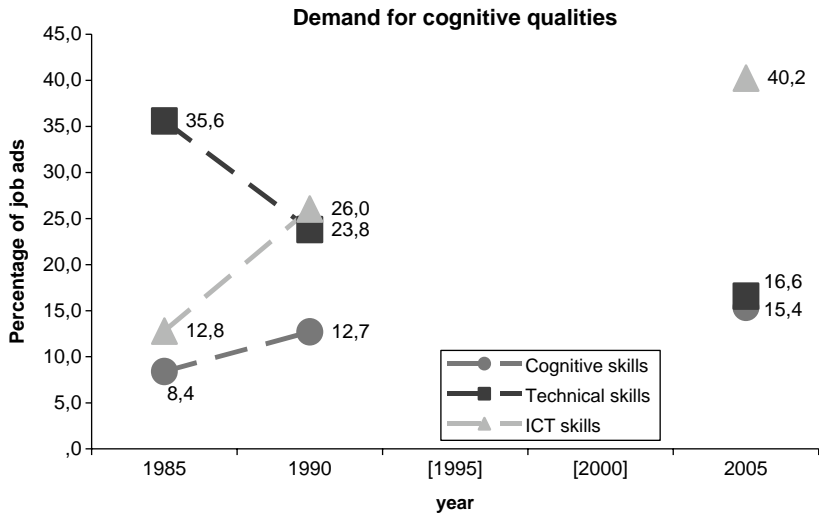


Figure 3. Trends in demand for cognitive qualities in newspaper job advertisements, Austria

by fitting a linear time trend in the log odds of demand for the different skill types (model 1). Then, occupational groups are included, so that we can see whether a possible time trend can be explained by developments in the occupational structure demanded in advertisements (model 2). If the effect of publication year drops below significance in this model, a potential time trend found in model 1 is then fully attributable to differences across time in the kinds of jobs that are advertised. A third model is estimated to see whether there are trends in the demand for skill types within each occupational group, by adding interaction effects between the occupational group dummy's with year. Table 2 shows the results of these logistic regression analyses.

6.1. Demand for educational qualifications

The first dependent variable is whether job advertisements demanded any form of educational qualification. Model 1 in Table 2 shows that this is indeed the case. Estimated linearly, the odds that a job ad demands any educational qualification versus not increases every year with $e^{0.028} = 1.028$. Thus, across the 20 years of our observation, this model predicts that the odds increase with $1.028^{20} = 1.74$. Model 2 shows that this trend is not attributable to changing composition of job advertisements according to occupational group; controlled for occupational group the

TABLE 2. Logistic regression of demand for educational qualifications and skill indicators

	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se
	Any educational qualification						Tertiary qualification						Vocational qualification					
Year (1985 = 0)	0.028	0.008***	0.032	0.009***	0.008	0.025	0.031	0.008***	0.030	0.015*	-0.062	0.072	0.014	0.007 ~	0.028	0.008***	0.019	0.024
Occupational group:																		
Managerial			-0.173	0.282	-0.579	0.396			3.494	0.534***	2.779	0.672***			-1.704	0.269***	-1.959	0.400***
Professional			3.997	1.027***	3.309	1.289*			8.487	1.125***	7.250	1.401***			-1.954	0.270***	-2.139	0.418***
Routine			-1.037	0.251***	-1.393	0.354***			-17.877	2401.9	-18.313	3546.9			-0.980	0.242***	-1.137	0.340***
office work																		
Service			-1.480	0.264***	-1.346	0.384***			0.756	0.574	-0.263	0.835			-1.500	0.256***	-1.224	0.373**
sector																		
Craft and trade			0.120	0.466	-0.148	0.553			-17.738	7083.8	-18.313	8270.0			0.283	0.461	0.128	0.544
Technicians (reference)																		
Year * occupational group:																		
Managerial					0.049	0.033					0.091	0.074					0.025	0.031
Professional					0.095	0.151					0.165	0.165					0.018	0.031
Routine					0.043	0.029					0.062	0.296.4					0.019	0.029
office work																		
Service					-0.004	0.030					0.113	0.079					-0.021	0.029
sector																		
Craft & Trade					0.047	0.076					0.062	1003.1					0.036	0.076
Constant	0.399	0.100***	0.856	0.229***	1.051	0.306***	-1.190	0.113***	-3.609	0.536***	-2.890	0.628***	-0.385	0.099***	0.709	0.219**	0.775	0.289**
Nagelkerke's R ²	0.019		0.286		0.295		0.021		0.799		0.801		0.005		0.121		0.128	

TABLE 2 (Continued)

	Model 1			Model 2			Model 3			Model 1			Model 2			Model 3												
	b	se		b	se		b	se		b	se		b	se		b	se											
Year (1985 = 0)	0.023	0.008**		0.004	0.014		0.026	0.011***		0.026	0.011***		0.022	0.031		-0.046	0.009***		-0.044	0.010***		-0.059	0.022					
Occupational group:																												
Managerial				2.843	0.484***		2.199	0.601***		0.324	0.346		0.004	0.559								-1.424	0.272***		-2.077	0.409**		
Professional				5.716	0.547***		5.759	0.825***		0.425	0.336		0.299	0.545								-1.725	0.280***		-1.947	0.417***		
Routine				-18.120	2410.4		-18.656	3546.9		-0.046	0.332		0.100	0.499								-1.348	0.239***		-1.227	0.339***		
office work																												
Service				0.521	0.531		-0.371	0.747		-1.279	0.441***		-1.094	0.719								-1.700	0.269***		-1.935	0.397***		
sector																												
Craft and trade				-0.333	1.116		-23.027	8708.4		-19.192	7087.1		-19.109	8270.0								-1.647	0.474***		-1.290	0.545*		
Technicians (reference)																												
Year * occupational group:																												
Managerial							0.097	0.075					0.027	0.039														
Professional							0.042	0.081					0.010	0.038														
Routine							0.085	296.4					-0.160	0.038														
office work																												
Service							0.115	0.079					-0.014	0.050														
sector																												
Craft & Trade							1.295	435.4					-0.022	1003.1														
Constant	-1.240	0.115***		-3.119	0.474***		-2.547	0.549***		-2.132	0.302***		-2.094	0.420***		-0.744	0.107***		0.532	0.210*		0.532	0.210*		-3.671	1185.1		
Nagelkerke's R ²	0.011			0.719			0.725			0.078		0.082			0.041				0.121			0.121			0.671	0.278*		
																											0.144	

TABLE 2 (Continued)

	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3		Model 1		Model 2		Model 3		
	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se	
Year (1985 = 0)	0.062	0.008***	0.080	0.010***	0.078	0.024**	0.065	0.008***	0.061	0.008***	0.054	0.024***	0.066	0.010***	0.066	0.010***	0.109	0.034***	
Occupational group:			ICT skills						Communication skills						Teamwork skills				
Managerial			-1.073	0.302***	-0.262	0.465			0.782	0.268***	0.560	0.416			0.419	0.325	0.979	0.657	
Professional			-0.502	0.274 ~	-0.784	0.505			0.136	0.267	0.164	0.438			0.533	0.315	0.286	0.712	
Routine			0.658	0.246**	0.447	0.379			-0.014	0.253	-0.226	0.397			0.259	0.306	1.094	0.609	
office work																			
Service			-1.356	0.294***	-1.287	0.555*			1.046	0.258***	1.196	0.401***			-0.168	0.327	0.958	0.656	
sector																			
Craft & trade			-20.214	6903.0	-19.751	8269.0			-2.301	1.043***	-24.150	8708.4			-0.726	0.785	0.398	0.983	
Technicians (reference)																			
Year * occupational group:																			
Managerial					-0.064	0.033 ~					0.021	0.030						-0.042	0.040
Professional					0.020	0.033					-0.001	0.030						0.012	0.042
Routine					0.024	0.029					0.020	0.029						-0.067	0.038
office work																			
Service					-0.004	0.035					-0.013	0.029						-0.082	0.040***
sector																			
Craft & Trade					-0.078	1003.1					1.155	435.4						-0.156	0.139
Constant	-1.592	0.125***	-1.472	0.234***	-1.452	0.327***	-1.178	0.111***	-1.491	0.230***	-1.423	0.328***	-2.166	0.152***	-2.370	0.290***	-2.950	0.557***	
Nagelkerke's R ²	0.079		0.234		0.246		0.096		0.169		0.175		0.079		0.096		0.116		

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$ (two-tailed).

Source: Job advertisements in three Austrian newspapers, 1985, 1990, 2005.

time trend remains significant and even increases slightly. Job advertisements for professional occupations more often demanded any qualification than technical jobs, whereas routine office work as well as service sector occupations demanded less often educational qualifications than technical jobs. Model 3 shows that the time trend is similar across occupational groups; none of the interactions are significant. Stated otherwise, the variations across occupational groups are similar across the years.

The demand for a tertiary qualification follows in many ways a similar pattern. Tertiary qualifications are increasingly demanded across time, with a magnitude similar to the demand for any qualification, which remains significant in model 2. The occupational groups most often demanding for tertiary qualifications are in managerial and professional occupations. None of the interactions are statistically significant (model 3), indicating similar time trends across occupational groups.

The demand for vocational qualifications slightly increased across time ($b = 0.014$), although the time trend is stronger when controlled for variations across occupational groups ($b = 0.028$; model 2). The fact that the trend is less strong in model 1 is because the occupational group heavily demanding vocational qualifications is decreasing in size (the reference category of technical occupations). All occupational groups except craft and trade demanded significantly less often for vocational qualifications than the reference group of technical occupations. Model 3 shows that the time trend is similar across occupational groups, or that the variation across occupational groups is similar across time.

The demand for a specific field of study in job advertisements increases significantly across the years. Findings in model two indicate that this trend is attributable to developments across time in the occupational structure displayed in job advertisements. Controlled for occupational group, the time trend does not remain significant. Professional occupations and managerial jobs demand more often a specific field of study than technical jobs. Both occupational groups have grown in size in today's labor markets; there are more high-skilled jobs demanding a particular field of study now than in the past. We furthermore see that the variation across occupational groups is similar across the years of research (model 3).

6.2. Demand for cognitive and technical qualities

The second dependent variable is whether job advertisements require some form of cognitive and/or technical qualities. These are divided into three components, namely cognitive skills, technical skills and ICT skills. Regarding the first component, cognitive skills, results of the regression

analysis in table three indicate that they are increasingly demanded across time ($b = 0.026$). Controlling for variations across occupational groups, the time trend remains significant. Cognitive skills are more demanded in the group of professional occupations than in managerial jobs; in jobs of the service economy, advertisements demand significantly less often for cognitive skills than in the reference group of technical jobs. Model 3 demonstrates that the variations within occupational groups are similar across years.

Another component of cognitive qualities are technical skills; requirements for them significantly decreased over the period of research ($b = -0.046$). Controlling for occupational group, model 2 shows that this trend is not attributable to a changing occupational structure. All occupational groups required significantly less often technical skills than the group of technical jobs. An explanation for the decreasing occurrence of technical skills in today's job advertisements could be that they referred to ICT-related technical knowledge in the past, which has been replaced by ICT skills.

This leads us to the last component of cognitive skills, the ICT skills. Requirements for these significantly increased over the 20 years of research ($b = 0.062$), with a time trend that even increases when controlling for occupational group ($b = 0.080$). This cannot be explained with changes in the occupational structure. Job advertisements for managerial positions and for the service sector significantly less often require ICT skills, compared to technical jobs. White-collar jobs, on the contrary, demand significantly more ICT skills than technical jobs. The findings in model 3 indicate that there is a trend towards decreasing demand for ICT skills in the service sector; all other interactions are not significant.

6.3. Demand for social skills

Requirements for communication skills increased significantly over time ($b = 0.065$). This time trend cannot be attributed to differences in the kinds of jobs that are advertised (model 2). Communication skills are significantly more demanded for managerial jobs and jobs in the service economy than for technical jobs. In the craft and trade sector, they are less demanded. This result is striking, since we would expect that jobs on top of the occupational scheme would be solely filled on the basis of formal qualifications. As shown in model 3, the time trend is also similar across occupational groups.

Teamwork, the second most frequently demanded social skill, also became significantly more important in recruitment within the period of

20 years ($b = 0.066$). The time trend remains significant when controlling for occupational structure. Being a 'team player' is more demanded among high occupational groups than among lower ones, although this result is not significant. What can be derived from model 3 is that the time trend is not similar across occupational groups; job advertisements in the service sector require less often the ability to cooperate with others.

7. Summary and conclusion

The paper attempted to analyse empirically employer's demand for certain job skills in the Austrian labour market between 1985 and 2005. We elaborated on Jackson's work of analyzing job advertisements from a single year and included a time span of 20 years, which allows a proper assessment of the increased merit selection (IMS) hypothesis. The main research question was whether there are changes across time in the demand for educational merits towards an increasing relevance of them, as proposed by the IMS-hypothesis. The relevance of this topic follows from criticism of the IMS thesis and from a lack of long-term and empirical studies of skill demand in the labour market.

Our empirical research is based on a content analysis of job advertisements published in the weekend editions of three daily Austrian newspapers. The overall picture we gained first is that job advertisements nowadays are much more complex than 15 and 20 years ago, respectively. Job advertisements from the past stated only a small number of requirements, compared to advertisements from today, which cover a whole range of demands towards their future employees. This complexity could be explained with educational expansion and the phenomenon of over-education, in which employers have to rely on additional screening devices for recruiting new staff.

The increased merit selection hypothesis would predict that educational qualifications are becoming more important over the period of research. Results clearly indicate that this is indeed the case in Austrian newspaper advertisements. Not only do requirements for educational qualifications significantly increase across time, but also occupational groups differ with respect to the importance of formal qualifications: professional occupations, amongst the highest occupational groups, also require the most and highest educational credentials. In this group, almost all job advertisements demand some form of educational qualification, mainly tertiary general educational degrees obtained in universities. Requirements for vocational education, on the contrary, only slightly increased across time. An explanation for that phenomenon is that the occupational group heavily demanding vocational qualifications, the reference category of technical

occupations, is decreasing in size. Contrary to Jackson *et al.* (2005) who seem to argue that the driving force in changing demands is really compositional change, we show that there is also an increasing demand for certain skills *within* occupations.

So far there has been a single-sided focus on the demand for a particular educational *level*. In moving beyond the traditional way of measuring education, we expand on the operationalization of education by looking at both level and field of study. Results of the regression analysis indicate that the increasing importance of field of study is attributable to changes in the occupational structure. In today's labour market there are more high-skilled jobs that demand a specific field of study compared to the past.

It must be said that the high relevance of vocational education and educational fields of study may be particularly found in Austria, the country of our study. From the cross-national literature we know that the educational systems of Germany, Austria and Switzerland are highly vocationally specific (Shavit and Müller 1998; Müller & Gangl, 2003). These countries can be characterized as occupational labour markets where access to numerous occupations is regulated through formal educational qualifications, often through apprenticeships of vocational education. In such systems it may be more likely that vocational education and educational fields of study are relevant in the selection process, and that their effects have persisted or increased across time (cf. Van de Werfhorst 2004).

Formal qualifications, however, are only one aspect of market value, and they were demanded in 66 percent of overall advertisements. This leaves empty space for other aspects of skills that are demanded by employers. Job advertisements nowadays also contain a whole range of social skills, mainly but not only in the service sector. Also among managerial occupations, the possession of social skills is a decisive criterion in job advertisements; especially communication skills are very important here. This result is striking because we would expect 'measurable' merits to be the only selection criterion amongst the highest occupational groups.

The increasing relevance of social skills could bring social background variables back into the recruitment process. Even though some social or 'soft' skills could be learned outside the family or peer groups, they may relate at least partly to social origin and thus ascription. People from different social backgrounds may differ in the extent to which they acquire these skills and thus compete under unequal conditions in the labour market. Therefore, the overall significance of social skills in recruitment could put a threat to the principle of equality of opportunities in modern societies. However, this depends much on the extent to which such skills are affected by ascriptive factors.

The overall picture, however, is that cognitive skills, educational qualifications and social skills are significantly increasing in relevance to employers. Nevertheless, recruitment via job advertisements is only one way to attract new employees, and there are other recruitment channels. Future research on the increased merit selection hypothesis should include the perspective of employers. Furthermore, in order to test whether social and personal skills can be included in the definition of merit we should know more about the impact of ascriptive factors in their acquisition. Only then can we resolve the issue whether particular attributes can be defined as merit (cf. Kingston 2006), or else, whether the whole concept of meritocracy is flawed by the fact that we cannot equate merit with achievement.

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EUROPEAN SOCIETIES

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Appendix: Coding frame

Every time a characteristic relating to a job requirement was mentioned, it was coded into the relevant category.

Case Information

Case number

Newspaper

Year of publishing

Occupational group

Salary indication (yes/no)

Size of the advertisement (small/middle/large)

Qualifications

General education (compulsory, secondary, tertiary)

Vocational education (upper secondary, tertiary, apprenticeship)

Field of study (8 categories – humanities, social sciences, economics, engineering, health, sciences, tourism, not mentioned)

Work experience (required/not required)

Cognitive qualities

Cognitive skills ('analytical skills', 'intelligence', 'quick perceptive faculty', 'the ability to learn new things')

Technical skills ('technical knowledge', 'able to use computer packages')

IT skills

Social and personal skills

Communication skills ('excellent communication skills', 'able to establish good customer contact')

Teamwork skills ('team player', 'able to cooperate with others')

Autonomy ('ability to work autonomous', 'ability to take over independent job tasks')

Leadership skills ('able to lead groups', 'able to take decisions')

Flexibility

Job commitment ('motivated', 'ambitious', 'committed')

Stress resistance ('able to cope with stress', 'able to work under pressure')

Mobility ('willingness to travel and/or work abroad')

Language skills

Personal characteristics

Age ('25–30 years old', 'young')

Appearance ('representable appearance', item was coded whenever an add required a picture of the applicant)

Gender

Other characteristics

e.g., driving license