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Skills, positional good or social closure? The role of education across structural–institutional labour market settings

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A theoretical approach is formulated that connects various theories of why education has an effect on labour market outcomes with institutional settings in which such theories provide the most likely mechanism. Three groups of mechanisms are distinguished: education as an indicator of productive skills, as a positional good and as a means for social closure. Conditions were formulated under which labour market behaviour is likely to correspond to the behavioural models underlying the three mechanism groups. To test the theoretical relationship between settings and mechanisms, I formulated hypotheses on setting variation in the (horizontal and vertical) process of matching educational level and field of study to jobs and its consequences for wages. Analyses in which Dutch survey data were combined with industry statistics confirmed the hypotheses.

Keywords: industry; job match; the Netherlands; comparative stratification; institutions; mechanisms

Introduction

Various theories explain why educational qualifications pay off on the labour market, such as in terms of wages or employment. Some studies have compared mechanisms in their predictive power (e.g. Bills 2003, 2004; Groot and Oosterbeek 1994; Layard and Psacharopoulos 1974; Weiss 1995). Such a 'mechanism contest' provides interesting knowledge, but it ignores the possibility that the value of a particular mechanism may depend on the structural–institutional setting that is analysed. On the other hand, existing research that focuses on variation in the education effect across institutional settings (e.g. countries) is usually not oriented towards comparing mechanisms but rather aims to explain variation in the strength of the effect of schooling by institutional characteristics (e.g. Harmon et al. 2001; Müller and Gangl 2003; Shavit and Müller 1998).

The current paper aims to bridge these two literatures. More specifically, my argument is that support for a particular mechanism may depend on the

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institutional constellation within which employers and employees act. To this aim, theories explaining why education influences labour market opportunities, such as wages or employment, are classified into three groups of mechanisms: 'education as an indicator of productive skills', 'education as a positional good' and 'education for social closure'. Furthermore, conditions are formulated under which these mechanisms offer a plausible explanation of the education effect. These 'conditions' refer to structural and institutional characteristics of parts of the labour market, and can, for example, be expected to differ not only across industries, but also between countries.

Importantly, rather than specifying between-setting variation in the *strength* of the effect of education, I shall focus on the variations in the *mechanisms why* education pays off on the labour market. This is a highly neglected issue in structural–institutional research on the effect of education, where the variation in the strength of the education effect has been the dominant object of analysis (e.g. Beck, Horan, and Tolbert 1978; Caroll and Mayer 1986; Müller and Gangl 2003; Shavit and Müller 1998). This single-sided focus on the strength of the education effect necessarily means that mechanisms are left unspecified, as different mechanisms may all point to strong education effects, be it for different reasons. The role of education may well vary strongly across settings, even in cases where the effects are of similar size.

Empirically, this paper focuses on structural–institutional settings defined by industry in the Netherlands. Two types of outcomes in the early phase of people's employment careers are analysed: the process of matching qualifications to jobs (vertically and horizontally) and the wage returns related to the matching process. I combine insights from empirical designs from labour economics on these outcomes with the institutional focus of comparative stratification sociologists.

The research question of this paper is: How do the three mechanisms of productive skills, positional good and social closure relate to structural–institutional settings on the labour market, and how is this translated into setting variation in labour market behaviour of young employees and their employers?

Such setting variation in the mechanisms why education pays off can presumably be observed in many advanced (post-) industrial societies, be it to a different degree depending on their institutions. The present paper studies variation across industries in the Netherlands. The Netherlands form one of the clearest testing grounds for our more widely applicable argument, perhaps together with Germany, Austria and Switzerland. The educational system has a large vocational sector, in which strong connections are sought with product markets of industries. This has led to an important role of industrial organisations in the development of educational curricula. Industrial relations are strongly organised through collective labour agreements at the industry level, and unions typically operate at the industry level as well. The need for formal qualifications is, as a consequence of a high level of nation-wide standardisation of the educational system, at least as significant as elsewhere in the post-industrial world. All this

leads us to expect that variations across settings in the dominance of mechanisms are relatively large in comparison with other countries, so important tests of the paper's argument can be made using employee survey data. However, the principal arguments on why settings vary in the dominance of selection mechanisms apply to many more countries with between-industry variation in credentialism, bureaucratisation and vocational orientation of the schooling system.[1]

The paper proceeds as follows. After having explained the three groups of mechanisms that explain why education leads to advantageous labour market opportunities, conditions are formulated under which such mechanisms are likely to explain the association between education and the labour market. Then, hypotheses are generated with regard to the incidence of and wage returns to overschooling, and the incidence of and wage returns to horizontal job matches. The dominance of the three mechanisms will be measured using industry-level variables that correspond to the conditions for employers' behaviour. These measurements are then included in mixed models combining industry-level data with survey data from Dutch graduates in order to test the hypotheses.

Three mechanisms for the education effect

Why are employers prepared to pay higher wages and give better employment prospects to people with higher rather than lower qualification levels? The theories of why education is important can be grouped into three classes, a distinction more often found in the literature (e.g. Caroll and Mayer 1986; Hannan, Schomann, and Blossfeld 1990; Rosenbaum et al. 1990).

First, there are theories arguing that education provides *productivity-enhancing skills* to individuals. Particularly, economists in the human capital tradition subscribe to this approach (Becker 1993). The central tenet of human capital theory is that education provides knowledge and skills that have a direct influence on the productivity of workers. Employers are willing to pay higher wages to highly educated workers because of this differential in productivity. It is useful to confine the human capital tradition to being concerned with its principle mechanism, namely the *productivity-enhancing* competencies that students acquire during the schooling period. Weiss (1995) calls this the learning model.

The second approach, the *positional good perspective*, argues that there is uncertainty and unawareness among employers concerning the marginal productivity of potential employees. Employers do not know very well which knowledge and skills employees bring with them to the labour market, let alone how these competencies affect productivity. That is why employers look for crude signals that are associated to groups of applicants (Spence 1973). Certain characteristics of groups of employees form a signal towards the employers about the potential value of an employee. One of these characteristics is education: a college degree gives broad information about the plausible productivity of anyone holding such a qualification. Employers use educational qualifications to screen workers (Arrow 1973).

Employers do not only make an estimation of the productivity but, crucial in this second perspective, that this is translated into an estimation of the training costs that are associated with hiring a worker with specific characteristics (Thurow 1976). Thurow has developed the job competition model in which two queues exist. The first queue comprises the available vacancies; the jobs to be taken by applicants. The order of this queue is determined by the complexity of the vacant jobs. The second queue consists of the potential employees, or applicants. This queue is ordered on the basis of the educational attainment of applicants. Selection and allocation on the labour market brings the two queues together, starting from the top of complex jobs and highly educated applicants. This model implies that education is a positional good (also called a relative good); to obtain a complex job (and thus receive higher incomes), one's position in the queue *relative to others* is crucial (cf. Hirsch 1977; Ultee 1980; Wolbers 1998). For this reason, Weiss (1995) talks about sorting models of education. It must be noted that education can be used as a sorting device on characteristics that individuals already had *before* entering schooling (e.g. intelligence, perseverance, etc.) as well as characteristics that they have obtained *in* schooling (e.g. learning skills). Both elements imply, however, that education functions as a positional good.

The positional good perspective differs from the productive skills approach in that it does not start from productivity-enhancing knowledge and skills obtained in education. More emphasis is placed on the relative position that people occupy on the labour market and the training costs that are associated with hiring a person with a certain qualification level. In the job competition model of Thurow, applicants do not compete for wages they are willing to work for but for 'training slots'. This implies that, in the productive skills approach, the *individual* holding a job is connected to a certain productivity level, whereas the positional good perspective sees productivity connected with *jobs*. Or, as Thurow puts it: '[T]he marginal product resides in the job and not in the man. The individual's earnings depend upon the job he acquires and not directly upon his personal characteristics' (1976, 77). The similarity in both approaches is, however, that both focus on the productive aspects of qualifications, either directly (productive skills) or indirectly (positional good).[2]

The third approach, labelled here the *social closure* perspective, includes theories arguing that the value of credentials has nothing to do with the productive capacities that have been incorporated, or the trainability indicated by such credentials, but instead argues that education functions as a legitimised means for social inclusion and exclusion. The basis of social closure theory is that elites monopolise 'access to resources and rewards' by closing off opportunities to less-advantaged groups (e.g. Murphy 1988, 10; Parkin 1979; Weber [1922] 1978). Educational qualifications, more often called credentials in this literature, provide a widely acknowledged form of exclusion; by demanding formal qualifications for access to jobs, employers can control access to privileged positions. Moreover, such behaviour of employers is usually not an

individualistic action, but rather comes in the form of collective behaviour, leading to *institutions* that govern the regulations regarding the requirements for formal qualifications (Brown 1995).

The productive skills theory and the positional good perspective start from the idea that selection and allocation on the basis of qualifications is beneficial for the productivity and efficiency of the organisation. Moreover, through technological developments, education has become even more important than before for the selection process, and through this, for productivity and efficiency. So says the functionalist modernisation theory, which is strongly related to neoclassical economics and human capital theory in particular (e.g. Davis and Moore 1945; Parsons and Shils 1951; Treiman 1970). The social closure perspective questions this (functionalist) rationality. Theories on education that belong to this perspective are the credentialism theory of Collins (1974, 1979), cultural reproduction theory (Bourdieu 1984; Bourdieu and Passeron [1977] 1990; Halsey, Heath, and Ridge 1980; 1992) and the correspondence principle of Bowles and Gintis (1976, 2002).

Economists usually do not distinguish between the positional good and the social closure perspectives. What economists call 'sheepskin effects' (Heywood 1994) refer to the fact that diplomas (made of sheepskin) give access to well-paying jobs, just like the credentialism theory of Collins (1979). However, in the economic perspective, these sheepskins serve as a screening device for productivity, something the social closure perspective denies. For this reason, it is relevant to separate the two ideal types.

Institutional conditions that make the three mechanisms work

I aim to formulate a theory on how the structural–institutional settings within which employers and employees operate influence the mechanism underlying the selection and allocation process on the basis of educational qualifications. This is something largely ignored in the literature. Although sometimes theoretical mechanisms are compared in their strength (e.g. Bills 2003, 2004; Groot and Oosterbeek 1994; Layard and Psacharopoulos 1974; Weiss 1995), the linkage of mechanisms to structural–institutional settings is something researchers tend to ignore (but see Allen 1997; Glebbeek 1988; Van der Velden and Wolbers 2007) found evidence that human capital factors mattered more in the private sector than in the public sector.

The question is which structural factors are influential on the behaviour of actors in the labour market such that their behaviour corresponds to the assumptions underlying the several theories. For example, under which conditions is it likely that employers use education as an indicator of the skills that education has generated? Such conditions are, I argue, related to the *possibilities* to select on the basis of productive skills, positional good or social closure. These possibilities determine the extent to which employers reduce uncertainties by relying on knowledge and skills, training costs or social

closure. A sociological theory of education and the labour market should thus formulate *conditions* under which different mechanisms work well in the explanation why education is rewarded on the labour market.[3]

Conditions for an efficient selection on productive skills

Aspects of both the labour supply and the labour demand are important to formulate conditions under which employers can rely on ready-to-use skills and knowledge.

As regards the supply side, it is important to start from the different types of education that are available for specific industries or occupations. When educational programmes prepare for a specific industry and are highly vocational specific, there are ample opportunities for employers to incorporate productive skills into the organisation by selecting on educational attainment of applicants. Particularly in industries that are strongly involved in so-called 'dual systems' in which students combine work with school, employers have many opportunities to enlarge productivity almost instantly when hiring someone with such a qualification. Employers reduce uncertainty of workers' productivity this way. If an employer depends on an 'educational source' that is generic in nature, it is much harder to use educational qualifications as a means to bring productive skills into the organisation. Additional training (formal or informal) need to be offered in order to increase productivity of workers.

With respect to the demand side of the labour market, it is, first, important to acknowledge that industries differ in the kinds of tasks that need to be performed. In some industrial sectors of the labour market, most work consists of the production of goods. For these kinds of labour, it is, conditional on the provision of industry-related vocational schooling, more straightforward that hiring on the basis of qualifications contributes directly to the functioning of workers within organisations than it is for work aimed at the production of services (cf. Wynn and Mueller 1998). Service-oriented occupations often demand more generally oriented skills, such as computer or language skills. The goods-producing industries have a higher capital intensity and productivity than the service sector (Bernhard and Jones 1996). In the manufacturing industries, it may then be assumed that recruitment is more strongly based on workers' productivity-enhancing skills.

A second important demand side factor that is relevant to the question whether employers incorporate productive skills into the organisation by selecting on qualifications is the expected duration of the career within the organisation. Selection on productive skills, or human capital, is more important when employers need instant utility from new workers. If workers can be offered a longer-term contract, it is less evident that employers need productivity immediately. Employers would then always have the possibility to offer additional training through enterprise-related courses or informal on-the-job training. More concretely, employers in a strong internal labour market

(Doeringer and Piore 1971), such as found in big bureaucratic organisations, will be less inclined to select on the basis of productive skills than employers in smaller, more open organisations. So, whereas Hannan, Schomann, and Blossfeld (1990) found a positive interaction between 'skilled' jobs and organisational-size-predicting wage mobility, it is unclear whether these skills are education based, or acquired on the job or not even skills at all.

Conditions for an efficient selection on the basis of education as a positional good

The functioning of education as a positional good (in particular training costs) will, firstly, be positively affected by the expected length of the employment relationship. An employer is only prepared to invest in training of employees if the cost of training is compensated in the form of productivity of a well-trained worker. Because costs go before revenues, employers have costs particularly in the beginning of the employment relationship. Only after some investment in schooling, can returns to the training costs be expected.[4]

This emphasis of the positional good perspective on the length of the employment relationship suggests that especially organisations with a strong internal labour market and with a large bureaucracy select personnel on the basis of training costs. Uncertainty with regard to careers is relatively small in such organisations due to standardisation of career lines, so returns to the invested training costs can easily be foreseen. Additionally, standardised career lines often include standardised training facilities and courses, so a clear picture exists of the (formal) training costs to be made.

In principle, one could argue that employers prefer to bring in directly applicable skills and knowledge by selecting on qualifications. Training costs would then only be used as selection mechanism when the possibilities for such a selection are restricted, for example, because there is a limitation in the supply of work-relevant skills from the educational system. However, this line of reasoning denies an important difference between productive skills theory and the positional good approach: productive skills theory assumes that productivity is associated with individual workers' characteristics, whereas the positional good perspective assumes that productivity is connected to jobs rather than to individuals (as previously discussed).

Secondly, it is plausible that industries differ in the extent to which jobs themselves are indicative of the productivity (job competition), or whether it is the employees who are indicative of their productivity (productive skills). The persons become more important for marginal productivity when it is easier for them to attract certain tasks and repel others. In this process, a task set is created that matches the individual worker. Jobs that are more strongly routinised will be less open to flexible task allocation than jobs for which tasks are less well defined. Furthermore, organisations seem to differ in the extent to which flexible task allocation is prevalent. In small organisations, employees

will often be allocated new tasks or be taken off others (or take the initiative themselves), depending on the fluctuations in the product market. In such organisations, it seems more evidently that the individual worker, rather than the job, is indicative of his or her productivity. So, selection and allocation on the basis of the productive skills mechanism is relatively likely. In bureaucratic organisations, on the other hand, the job itself is an important indicator of productivity of workers, so training costs become more important while ready-to-use skills are less relevant.

A third, and last, organisational characteristic which makes it attractive for employers to select on the basis of trainability is the technological position. Organisations that closely follow technological developments, or take part in technological developments themselves, can simply not rely on the supply of ready-to-use skills from the educational system. They simply need to train their workers themselves in order to be able to follow or shape modern technology. One industry where such organisations are typical concerns information, communication and technology (ICT). An important part of careers of ICT professionals consists of training aimed specifically at the organisation. To keep up to date with the continuously changing technology, it is moreover essential to be trained more or less continuously, and not only at the start of (or before) the employment relationship.

Conditions for an efficient selection on the basis of social closure

According to the social closure perspective, cultural capital and formal credentials tell nothing about the extent to which an applicant can be made productive, but whether an applicant comes from the 'right' social circles. Given this arbitrariness of education, we should, in our search for conditions under which it is likely that employers select workers on the basis of this mechanism, look for situations where productivity is only limitedly affected by arbitrary selection (cf. Allen 1997). In this relation, we should look for settings in which formal qualification demands are strongly institutionalised in order to regulate supply and demand for credentials (Weeden 2002).

The first organisational characteristic that is important for these two factors is whether the organisation is part of the public or the private sector. In the governmental sector, more rules exist when it comes to formal qualification demands for vacant positions. This means that *ceteris paribus*, formal credentials play a more important role here than in the private sector. Additionally, it may be more difficult to monitor productivity in the public sector, so the potential loss in productivity caused by selection on the basis of social closure cannot easily be observed. This may encourage employers to select workers who 'fit well' into the organisational culture even if the productivity-enhancing competencies are hard to determine. Also Van der Velden and Wolbers (2007) found evidence that human capital factors mattered more in the private sector than in the public sector.

The second organisational characteristic that affects selection on the basis of social closure is related to the need of employers to comply with regulations and agreements with regard to the selection on and rewarding of qualifications (Bills 2005; Weeden 2002). Particularly, when employers and employees within industries are heavily organised, such agreements are formed. Bills (2005) analysed the impact of occupational closure on the incidence of work-related training and of operationalised closure on the basis of 'professional or legal requirements for further training'. Such an operationalisation is strongly connected to the perspective of closure assessed in the empirical work of this paper. I focus explicitly on agreements between employers' and employees' organisations, although from an industry rather than occupational perspective. In 'coordinated market economies' such as the Netherlands, collective labour agreements are negotiated between industry-based trade unions, industry-based employers' organisations and the state (Soskice 1994; Visser and Hemerijck 1997), making industries a more important 'workhorse of closure' (Weeden 2002) than in liberal market economies such as the United States. Other variants of social closure theories, in particular those related to cultural capital theory, are not assessed empirically in this paper.

Measuring the workings of the three mechanisms across industries

The conditions formulated above vary across industries, and for many of them, indicators can be found at the industry level. This way, it is possible to derive measurements that indicate the dominance of a particular behavioural model across industries. To this aim, I employed a factor analysis on a collection of eight industry-level variables gathered from various sources, all referring to the year 2000, or if not possible, adjacent years.[5]

These variables are (with their sources between brackets):

(1) The percentage of graduates indicating that they have mastered their occupation-relevant knowledge in school (aggregated from graduate survey data described below).
(2) The percentage of graduates indicating that they have mastered their occupation-relevant methods in school (aggregated from graduate survey data).
(3) The percentage of organisations with more than 500 employees (aggregated from graduate survey data).
(4) The percentage of employees covered by a collective labour agreement (from the DUCADAM database maintained at the Amsterdam Institute of Advanced Labour Studies (AIAS), which is collected in cooperation with the largest trade union conglomerate in the Netherlands, FNV (Schreuder and Tijdens 2003)).
(5) Whether the collective agreement includes a training fund (DUCADAM database).

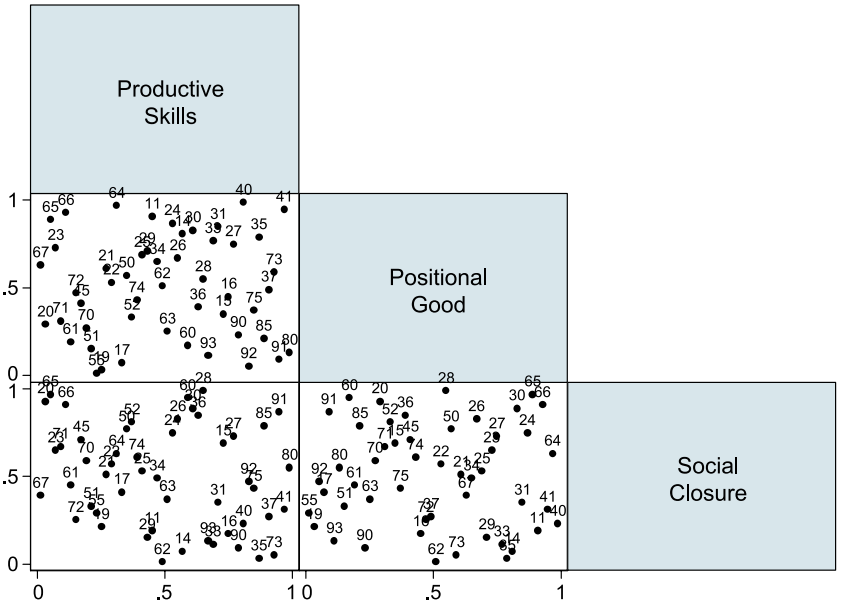
(6) Labour productivity (OECD STAN Database for Structural Analysis of Industries).
(7) The percentage of employees who have followed any type of work-related training (Eurostat).
(8) The percentage of employees who have followed continuous vocational training courses (Eurostat).

Table 1 shows factor loadings of these items on the three factors (mecahnisms). It appears that the factor structure corresponds closely to the three mechanisms for the education effect.[6] On the second dimension, very high loadings were found of the items referring to skills learned in schools, which refer to the productive skills mechanism. The first dimension covers mainly characteristics that make it likely that employers use education as a positional good, such as the prevalence of large organisations, and the extent to which the industry trains its workers on the job. Also, labour productivity scores relatively high on the positional good dimension, and has a smaller but still reasonable loading on the productive skills dimension. Interestingly, labour productivity is unrelated to industry characteristics pointing towards social closure (third factor), in particular the coverage and substance of collective agreements. Thus, whether schooling is used as a legitimate means for social closure is not related to labour productivity.

Figure 1 plots the dominance of the three mechanisms across industries in a three-dimensional space, measured by the factor scores resulting from the

Table 1. Factor loadings of industry-level variables.

	Mechanism		
	Positional good	Productive skills	Social closure
Percentage of employees who learned occupational knowledge in school	.069	.888	−.001
Percentage of employees who learned occupational methods in school	−.130	.934	.044
Collective agreement coverage	.024	.076	.812
Percentage of organizations with > 500 employees	.689	−.054	−.171
Collective agreement includes training fund	−.001	−.051	.804
Labour productivity	.293	.145	−.068
Percentage of employees with any type of training	.896	−.135	.236
Percentage of employees with continuous vocational training courses	.899	−.066	.146



List of industries:

11 Oil and gas extraction
14 Mineral extraction
15 Production of food products and beverage
16 Manufacture of tobacco products
17 Manufacture of textiles
18 Manufacture of clothes, dressing
19 Tanning/dressing of leather
20 Manufacture of wood products excluding furniture
21 Manufacture of paper and paper products
22 Publishing/Printing and reproduction of recorded media
23 Oil and coal processing industry
24 Manufacture of chemicals and chemical products
25 Manufacture of rubber and plastics products
26 Manufacture of other non-metallic mineral prod.
27 Manufacture of basic metals
28 Manufacture of fabricated metal products
29 Manufacture of machinery and equipment
30 Manufacture of office equipment and computers
31 Manufacture other electronic machinery
33 Manufacture of medical instruments
34 Manufacture of motor vehicles and trailers
35 Manufacture of other transport equipment
36 Manufacture of furniture and manufacturing NEC
37 Recycling
40 Electricity, gas, steam and hot water supply
41 Collection and distribution of water
45 Construction
50 Sale, maintenance and repair of motor vehicles, fuel
51 Wholesale trade and commission trade
52 Retail trade, repair of personal and household goods
55 Hotels and restaurants
60 Land transport
61 Water transport
62 Air transport
63 Supporting transport activities and travel agencies
64 Post and telecommunications
65 Financial intermediation, excluding insurance/pensions
66 Insurance and pension funding
67 Activities auxiliary to financial intermediation
70 Real estate activities
71 Renting machinery/equipment, no personnel
72 Computer and related activities
73 Research and development
74 Other business services
75 Public administration and defence
80 Education
85 Health and social work
90 Environmental services
91 Activities of membership organizations
92 Recreational, cultural and sporting activities
93 Other service activities

Figure 1. Standardized factor scores of industries on the three mechanisms for the effect of schooling on labour market outcomes.

factor analysis above. The place that an industry takes in this space is determined by the extent to which productive skills, positional good and social closure are the mechanisms along which educational qualifications are rewarded. Figure 1 also shows that the correlations between the dimensions of educational reward are very low.[7]

Testing the theory

As said above, I do not assume that the *strength* of the effect of education on labour market outcomes varies between structural settings, but rather the *theoretical mechanism behind* the education effect. Including multiplicative interaction terms between schooling and setting variables in models predicting some sort of labour market success will thus not be an adequate way of testing the theory (see also Bills 2003). This requires us to make deductions from the broader theory in such a way that unique links are established between theories and hypotheses. Hypotheses are derived with regard to industrial variations in the process of matching educational qualifications to jobs (vertically and horizontally) and in the implications of matching for wages.

The incidence of and returns to overqualification

The first labour market outcome where significant differences between settings can be expected concerns the *vertical* process of matching educational achievements to labour market positions. An important aspect of Thurow's (1976) job queue theory, headed under the positional good perspective here, is the assumption that productivity levels are attached to jobs rather than to individuals (unlike the productive skills theory, which assumes the opposite). Furthermore, education is seen as a positional good, and employers have, in principle, a preference for employees who are as highly skilled as possible. This preference results from the fact that education does not primarily indicate productive skills, but rather the training costs the employer has to bear to prepare a worker for a job. It is cheaper to train highly skilled individuals than it is to train people with lower educational levels. Hence, people with high educational levels are always preferred to persons with lower levels, even if the job does not require that particular level of schooling.

As productivity levels (and thus wages in the world of neoclassical economic theory) are attached to jobs more than to individuals, it can furthermore be expected that the employer does not have to pay more for an overqualified worker than for an adequately trained person on a similar job. Although Thurow's claims may seem plausible, my theory presumes that this pattern is likely to *vary* across structural–institutional settings. Thus, although in cross-section, returns to overschooling may be non-zero (e.g. Hartog 2000), these returns may be an average across settings that vary in this respect.

Following on from this, the hypothesis is formulated that overschooling is a more frequently observed phenomenon in settings strongly selecting on the basis of education as a positional good, than it is in settings where the positional good mechanism is weak (*Hypothesis 1a*). Furthermore, because productivity is connected to jobs and not to individuals, *wage returns* to years of surplus education will be lower the more dominant the positional good mechanism is (*Hypothesis 1b*).[8]

In contrast, in industries where the human capital/productive skills explanation fares well, wage returns to overschooling can be expected to be relatively high (*Hypothesis 2*). Productivity is related to the person according to human capital theory, so an overschooled individual will be more productive, thereby earning higher rewards.

In settings where social closure mechanisms are set in place, strict regulations apply as to which qualifications are needed to be hired. Through coordination of employment relations, formal qualification demands for functions are likely to be agreed. Because of the interests of the workforce, trade unions will demand particular qualification demands for jobs. This means that overqualification is less likely the more strongly collective agreements are institutionalised. Furthermore, in socially closed settings, productivity of the organisation is not harmed too much by following these formal rules. This limits the incentive to hire overqualified personnel. Another argument may lie in the correspondence principle of Bowles and Gintis (2002). If different educational levels prepare for different positions in the occupational hierarchy, then overqualified workers would have obtained attributes that make them unfit for the work to be done. Furthermore, overqualified workers are not expected to earn more than other people with similar job levels but adequate schooling. One way in which social closure is manifested concerns strict regulations with regard to pay scales connected to occupations. In such contexts, overqualification will plausibly not pay off. In settings scoring low on social closure, on the other hand, less stringent regulations apply as to the pay of occupations. From this, a hypothesis can be deduced that overqualification is observed less frequently the more dominant the social closure mechanism is (*Hypothesis 3a*). Moreover, in those relatively rare instances when overqualified workers are hired, overqualification should pay off less in socially closed settings relative to socially open settings (*Hypothesis 3b*).

Horizontal job match and its wage return

Wolbers (2003) demonstrated that the incidence of horizontal job matches varies across fields of study and across countries depending on the size of the vocational educational sector. Horizontal job matches were also shown to be beneficial for occupational status attainment. Moreover, mismatches were less strongly penalised in terms of occupational status in countries with an extensive vocational training system, supporting the notion of vocational education

as a 'safety net' (Arum and Shavit 1995). However, two shortcomings of the study by Wolbers are that, first, it was assumed that job matches were equally beneficial across industries within countries, and, second, only educational institutional characteristics were observed (i.e. the size of the vocational training sector). The approach of the present study is that institutional differences also exist among industries, and that various kinds of institutional factors may play an important role here.

Following the positional good perspective, schooling mainly indicates trainability, partly on pre-school characteristics, such as intelligence. It is expected that a person's educational field of study – in addition to educational level – is not very relevant in selection and allocation process. This may especially be true for the Dutch educational system, where choices for educational fields are mostly unconstrained, conditional on having completed the appropriate preparatory secondary school type. This may imply that trainability is mainly indicated by someone's educational level, and not so much by one's field of study. Therefore, when an employer in an industry that strongly selects on the basis of education as a positional good can select someone for a job, less often someone is hired with the matching field of study than when the positional good mechanism is weak. Thus, it is expected that relatively fewer horizontal job matches are found (between type of job and field of study), the more dominant the positional good mechanism is (*Hypothesis 4a*).

When selection and allocation is predominantly done on the basis of productive education-based skills, on the other hand, it may be expected that the field of study is very relevant in the selection and allocation process. If employers expect to bring productive skills into the organisation in the hiring process, it is unlikely that the type of skills is sufficiently indicated by the educational level. Rather, they may trust on the educational field of study of applicants as an indicator of the specific skills that are expected to be brought into the workplace. The more dominant the productive skills mechanism is, the more often horizontal job matches will be encountered (*Hypothesis 4b*). Also, wage returns to matching employment should be greater the more dominant the productive skills mechanism is (*Hypothesis 5*).

With regard to the social closure dimension, it is also expected that it affects the prevalence of horizontal job matches positively. One of the ways in which social closure is manifested in the labour market is through licensing and certification (see e.g. Weeden 2002). This means that formal regulations exist as to educational requirements for jobs, including specific educational fields of study. And also in the cases when formal regulations with regard to the requested field of study is absent, still the institutionalised and formalised nature of employment relations in social closure settings could mean that employers have a clear understanding of the profile of applicants they are looking for. Note that this is relative to settings where social closure is weak. Additionally, as Bourdieuian applications of social closure theory imply that employers select on the basis of 'taste' (e.g. towards applicants coming from

the right social circles), it could very well be that employers prefer workers with an educational background that matches the work to be done, and the cultural and educational background of colleagues. In sum, it is expected that horizontal job matches are more often found the more dominant the social closure mechamism gets (*Hypothesis 4c*).

Summary

Summarising the core argument of this study, my claim is that the adequacy of mechanisms explaining why educational qualifications are rewarded on the labour market varies between industries. Theories relating to education as generating productive skills, or education as a positional good or education for social closure have varying levels of applicability, depending on institutional features of industries. This general claim is tested on the process of matching qualifications to jobs, both in terms of vertical and horizontal forms of matching. In industries where the productive skills mechanism is working well, overschooling is expected to be rewarded relatively well, because productivity is related to the individual rather than to the job. I also expect horizontal job matches to be more likely (and more rewarding) here, relative to industries where the productive skills mechanism fares worse. When education functions as a positional good, on the other hand, I expect overschooling and horizontal mismatches to be observed more frequently, although the rewards to overschooling are expected to be modest. Social closure institutions decrease the likelihood of overschooling and horizontal job mismatches, and such mismatches are also less rewarding, it is expected.

Research design

Data

The survey data for our purposes come from the yearly graduate surveys financed by the Dutch Ministry of Education, Culture and Sciences, and run by the Research Centre for Education and the Labour Market (ROA) of Maastricht University. These surveys have been held among recent graduates on a yearly basis from the mid-1990s onwards. I will use the surveys of graduates of higher education (vocational colleges [HBO {*hoger beroepsonderwijs*} monitor] and universities [WO {*wetenschappelijk onderwijs*} monitor]) of the years 1999–2003 (ROA, 1999–2003). The advantage of using data on recent graduates is that many of their labour market outcomes are directly affected by their educational past. Depending on the dependent variable that is analysed, the analytical sample varies between 68,479 and 99,264 individuals, of which approximately two thirds are from vocational colleges and one-third from universities.[9]

Two regression-type models are employed: linear and binary logistic. Given the clustered nature of the data (individuals nested within industries), the models are estimated using multi-level random intercept models.[10]

Variables

Setting-level variables

The position of industries on the three dimensions of Figure 1 are summarised into three factor scores for each industry: one on each dimension. These factor scores are standardised using a proportional score between 0 and 1. This eases the interpretation of the coefficients. This leads to three industry-level variables: *productive skills index*, *positional good index* and *social closure index*.

Individual variables

Overqualification is measured by comparing the actual level of schooling with the level of schooling required by the employer for the job that the respondent holds (graduate surveys). To transform these levels into the number of *required years of schooling* and the number of *years of surplus education*, educational levels are transformed into years of schooling it nominally takes for completion. This way, university is set to 17 years, vocational college to 15 years, higher secondary level to 12 years (including intermediate vocational [MBO {*middelbaar beroepsonderwijs*}] and intermediate and upper secondary general [HAVO/VWO {*hoger algemeen voortgezet onderwijs*/*voorbereidend wetenschappelijk onderwijs*}]), and lower secondary level to 10 years (including lower vocational [VBO {*voortgezet algemeen volwassenen onderwijs*}] and lower general [MAVO {*middelbaar algemeen voortgezet onderwijs*}]). The resulting required years of schooling range from 10 to 17, and the years of surplus education range from –2 to 7.

The variable indicating a *horizontal job match* is based on the survey question whether respondents say their employer requested the field of study of the respondent. The same field of study or related discipline was contrasted with not a similar field of study.

In both data sets, I furthermore employ analyses on the *natural logarithm of gross hourly wage*.

For both types of data sources, I included *gender* and *educational field of study*. This is done in order to be confident that possible setting-level variation in the effects is not a consequence of (self-) selection patterns.

Results

Prevalence of and returns to overqualification

In the first model of Table 2, the number of years of surplus education, a recognised way to study overqualification and its wage returns (e.g. Cohn and Kahn 1995; Daly, Büchel, and Duncan 2000; Hartog 2000 for discussions), is the dependent variable. Here, it is seen that the impact of the dominance of the mechanisms correspond to our *Hypotheses 1a* and *3a*. Overschooling is a more prevalent phenomenon in settings strongly selecting on the positional good

Table 2. Incidence of and wage returns to overschooling.

	Years of surplus education	Wage returns Model 1	Wage returns Model 2	Wage returns Model 3	Wage returns Model 4
Industry-level variables					
Productive skills index	–0.0575	0.0231	–0.00971	0.0233	0.0252
	[0.0423]	[0.0350]	[0.0346]	[0.0352]	[0.0347]
Positional good index	0.118***	0.183***	0.178***	0.210***	0.186***
	[0.0417]	[0.0345]	[0.0339]	[0.0350]	[0.0342]
Social closure index	–0.0829*	–0.00202	–0.00227	0.000266	0.0183
	[0.0426]	[0.0353]	[0.0346]	[0.0355]	[0.0354]
Individual-level variables					
Educational field of study dummies	Yes	Yes	Yes	Yes	Yes
Required years of schooling	–3.737***	0.0711***	0.0719***	0.0713***	0.0706***
	[0.0169]	[0.00209]	[0.00209]	[0.00209]	[0.00209]
Required years of schooling squared	0.106***				
	[0.000599]				
Surplus years of schooling		0.0254***	0.00683**	0.0354***	0.0376***
		[0.00235]	[0.00323]	[0.00296]	[0.00410]
Male	0.0173***	0.0797***	0.0796***	0.0794***	0.0797***
	[0.00469]	[0.00377]	[0.00377]	[0.00377]	[0.00377]
Cross-level interactions					
Surplus years × Productive skills index			0.0327***		
			[0.00392]		
Surplus years × Positional good index				–0.0274***	
				[0.00490]	

Table 2. (*Continued*).

	Years of surplus education	Wage returns Model 1	Wage returns Model 2	Wage returns Model 3	Wage returns Model 4
Surplus years × Social closure index					–0.0207***
					[0.00567]
Constant	33.29***	1.414***	1.426***	1.400***	1.405***
	[0.124]	[0.0505]	[0.0500]	[0.0507]	[0.0503]
Variance (industry level)	0.005	0.004	0.004	0.004	0.004
Variance (individual level)	0.357	0.231	0.231	0.231	0.231
Log likelihood	–77,643	–58,980	–58,950	–58,969	–58,978

Source: HBO monitor 1999–2003; WO monitor 1999–2003.
Notes: N (individual) = 85,786, N (industries) = 50. Standard errors in square brackets. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

mechanism than in settings where this mechanism is weak. Also, the impact of the social closure dimension is in the expected direction: the stronger the social closure dimension is, the less often overqualification is encountered. The strength of the productive skills mechanism has no significant effect on overqualification. However, the negative effect conforms to the notion that employers would need to compensate for overqualified work, as productivity is related to individuals rather than to jobs in productive skills theory.

Turning to the wage returns to overschooling, of which the results are displayed in the other columns of Table 2, we see, first, that the returns to surplus education are much lower than to required years of schooling (b = 0.0254 vs. b = 0.0711; Model 1). However, if interaction terms are included for surplus education along with industry variables, it is evident that these returns are not the same across settings. Thus, assuming that the wage returns to overqualification are the same for all industries neglects important variations across structural–institutional settings in the process of matching individual educational attainment to jobs.

Model 2 shows that the returns to overschooled years are higher than the average in industries strongly functioning according to the human capital logic (positive interaction effect of surplus education (productive skills index). The model estimates overschooled years to pay off with a rate of return between 0.007 and 0.040, depending on the extent to which industries score lowest or highest on the productive skills index. In industries where the human capital logic prevails, it is indeed the case that the individual skill level pays off relatively well, independent of the job that is held. This supports *Hypothesis 2*.

In contrast, Model 3 shows that industries that score high on the positional good index have a lower rate of return to overschooling. This is in line with the central tenet of Thurow's view that productivity is related to a job rather than to the individual job holder. I thus found support for *Hypothesis 1b*.

Overschooled years also pay off less the more dominant the social closure mechanism gets (negative interaction: surplus education × social closure). Given the strong regulations with regard to pay scales attached to occupations, socially closed settings will only modestly reward overqualification. This finding supports *Hypothesis 3b*.

Table 2 also shows that wages are higher when the positional good mechanism becomes stronger. This supports earlier findings in a slightly different manner, namely that wages are higher in bureaucratic, larger and hi-tech sectors.

Horizontal job match

The second matching process between education and work is between educational field of study and the domain of occupation. I analyse between-setting variation in the prevalence of horizontal job matches and in the wage returns to job matching.

In Table 3, it is shown that horizontal job matches are often found in settings strongly selecting on productive skills (supporting *Hypothesis 4b*). Between the extreme values on the strength of the productive skills mechanism (0 and 1), the odds of having a horizontal job match increases with a factor 3.5. Support for *Hypothesis 4a* is not found. The impact of the positional good index is non-significant and positive, rather than negative. Apparently, it cannot be concluded that selecting on positional good would limit the importance of matching between fields of study and type of occupation. The social closure mechanism is also positively associated with horizontal job matches, as was expected in *Hypothesis 4c* (although the effect is not significant). Through processes of formal regulations and the importance of taste, social closure only modestly affects employers to prefer workers with matching qualifications.

In Model 2 of Table 3, I included interaction effects between vocational college and the productive skills index, and between fields of study and the

Table 3. Impact of industry-level and individual-level variables on horizontal matching (logit).

	Model 1	Model 2
Industry-level variables		
Productive skills index	1.244***	1.597***
	[0.273]	[0.297]
Positional good index	0.203	0.292
	[0.267]	[0.238]
Social closure index	0.17	0.0829
	[0.274]	[0.244]
Individual-level variables		
Vocational college	0.390***	–0.0515
	[0.0210]	[0.0421]
Male	0.259***	0.246***
	[0.0193]	[0.0194]
Educational field of study dummies (ref: natural science)	Yes	Yes
Cross-level interactions		
Vocational college × Productive skills index		0.798***
		[0.0682]
Educational field of study × Productive skills index	No	Yes
Constant	–0.303	–0.394
	[0.273]	[0.264]
Log likelihood	–41,464	–40,831

Source: HBO monitor 1999–2003; WO monitor 1999–2003.
Notes: *N* (individual) = 85,786, *N* (industries) = 50. Standard errors in square brackets. ***$p < 0.01$.

productive skills index. This model shows that the impact of the productive skills index is stronger for vocational college graduates than for university graduates.

In Table 4, the wage returns to horizontal job matches are displayed. This table shows that horizontal job matches lead to higher wages (of about 7%) relative to non-matching employment. This supports Wolbers' (2003) findings on occupational status attainment. However, contrary to the expectations, horizontal job matches are not rewarded at a higher rate in settings strongly selecting on productive skills (*Hypothesis 5*). Thus, matching is equally important for higher wages, independent of the dominance of the productive skills in an industry.

Table 4. Wage returns to horizontal matching.

	Model 1	Model 2
Industry-level variables		
Productive skills index	0.0379	–0.280***
	[0.0381]	[0.0507]
Positional good index	0.207***	0.207***
	[0.0375]	[0.0365]
Social closure index	–0.00649	–0.011
	[0.0383]	[0.0373]
Individual-level variables		
Male	0.0826***	0.0830***
	[0.00379]	[0.00379]
Vocational college	–0.137***	–0.193***
	[0.00421]	[0.00924]
Horizontal match dummy	0.0714***	0.0742***
	[0.00415]	[0.00819]
Educational field of study dummies	Yes	Yes
Cross-level interactions		
Educational field of study × Productive skills index	No	Yes
Horizontal match × Productive skills index		–0.0154
		[0.0134]
Vocational college × Productive skills index		0.0914***
		[0.0135]
Constant	2.507***	2.740***
	[0.0395]	[0.0451]
N (individual)	85,786	85,786
N (industries)	50	50
Log likelihood	–59,523	–59,403

Source: HBO monitor 1999–2003; WO monitor 1999–2003.
Notes: Standard errors in square brackets. ***$p < 0.01$.

Conclusions

In this paper, I formulated a theoretical approach that connects various theories of why education would have an effect on labour market outcomes with structural settings in which such theories would indeed work well. Three groups of mechanisms are distinguished: education as an indicator of productive skills (human capital), education as a positional good and education for social closure. I formulated conditions under which employers behave in line with the behavioural assumptions of the three mechanisms. This led to a classification of structural–institutional settings based on industry-level data on the expected strength of the three mechanisms.

To test the theoretical relationship between settings and mechanisms, deductions were made from the overarching theory. I analysed the (vertical and horizontal) process of matching skills to jobs and its consequences for wages. Using Dutch survey data on recent graduates, my results confirmed various hypotheses that were formulated. First, it was shown that relatively many people working in settings strongly selecting on the positional good mechanism are overqualified, and that relatively few people are overqualified in socially closed settings. Furthermore, the wage returns to overqualification were relatively low in settings strongly selecting on the positional good mechanism and the social closure mechanism, whereas these returns were higher in industries in which the human capital mechanism works well. So, whereas other research has shown that overschooling is rewarded with a lower rate of return than 'required' years of schooling for a particular job, I demonstrated that industries differ in the extent to which overschooling is rewarded. The returns vary from close to zero to a little below the returns to required years of schooling, with high returns in industries where the human capital logic prevails, and lower returns in industries in which education functions as a positional good. This means that this study has 'contextualised' theories why education is rewarded by stating that industries with a strong alliance with vocational education work pretty much along lines of human capital theory, whereas industries with a 'training culture' function according to the logic that education is a positional good. Industries that have strong social closure institutions by means of collective labour agreements induce strong regulations concerning the matching of individuals to jobs.

By connecting mechanisms to settings, this paper contributes to the sociology of labour markets in two important ways. First, whereas earlier structural–institutional stratification research has mainly observed setting differences in the *strength* of the education effect (e.g. Beck, Horan, and Tolbert 1978; Caroll and Mayer 1986; DiPrete and Grusky 1990; Müller and Gangl 2003; Shavit and Müller 1998), this study has shown that it is useful to examine setting-variation in the *mechanisms why* education affects labour market outcomes. This not only improves our understanding of the usefulness of well-known mechanisms as such, but it has also led to a

conditional understanding of this usefulness. Rather than compare mechanisms in their predictive power in a given setting, this paper has argued that labour market behaviour might correspond to different mechanisms in different settings. With this approach, I have bridged research that compares mechanisms in their relative strength (that does not pay attention to the structural–institutional setting of analysis) with studies that focus on comparative institutional analysis (without focusing on the comparison of mechanisms).

Second, this paper brought together various strands of research on structural–institutional environmental factors from industry, occupation and country perspectives. This means that the broader theoretical framework can be extended to other domains of research in which the role of education varies across institutional settings, for example, to country differences. One of the most notable differences between educational systems is the size and form of the vocational education sector (Allmendinger 1989; Culpepper and Finegold 1999; Haller et al. 1985; Korpi et al. 2003; Shavit and Müller 1998). In countries with detailed vocational training programmes, particularly in the 'dual system' where students are enrolled in both school and the work place, employers can more easily select on the basis of productive skills (human capital) than in countries where the education system is mainly aimed at generating general competencies in their students (Barone and van de Werfhorst 2011; van de Werfhorst 2009, 2011). Thus, in German-speaking countries (Germany, Austria and Switzerland), human capital is a more relevant mechanism for the effect of schooling on the labour market than in the United States or the United Kingdom, which have a more generally oriented schooling system. This makes the United States a plausible ground for selection of personnel on the basis of trainability (positional good). Additionally, in countries with a large public sector, and/or with much coordination of employment relations, formal qualification demands may advance the applicability of the social closure mechanism for the education effect.

Extension of this framework to other levels at which the usefulness of mechanisms varies will improve our understanding of the role of education on labour markets. This is essential to tackle important problems in many (post-) industrialised societies. For example, in many nations, the common view is that tertiary schooling enrolment should be increased in order to have a workforce with relevant skills. My approach may lead to a nuanced view on this, making this claim more relevant in some segments of the labour market than in others.

Notes

1. Although North American research observes variation across occupations in the social closure mechanism (e.g. Weeden 2002; Weeden and Grusky 2005), the 'workhorses of social closure' (Weeden 2002, 57) in coordinated market economies such as the Netherlands are often found at the industry level.

2. Another difference between the two perspectives, on which the positional good approach seems most acceptable, is that human capital theory assumes that the market will be cleared automatically and unemployment will disappear (equilibrium). The positional good perspective allows a labour market to move from an equilibrium to a situation of imperfection (Weiss 1995).
3. It is important to emphasise that there are no reasons to assume that an employer would have a negative opinion about any of the three mechanisms so long as it would serve the interests of the organisation. When hiring someone, an employer will not oppose the idea that this person already possesses productive skills, or is easily trainable or fits well into the organisational culture. However, employers of different industries can be ranked with regard to the plausibility with which they correspond to the behavioural models underlying the three mechanisms: whether they select on skills, on trainability or on social closure.
4. By this, I do not mean to say that employers select workers solely on the basis of the perceived training costs at the beginning of the employment relationship. Education plausibly also functions as an indicator of training costs to be made later in the career. However, later in the career, educational qualifications become decreasingly valuable as an indicator of training costs and make room for other indicators, such as experience and position in the organisation. Employers will, thus, fundamentally select on the above-mentioned chronology of costs and revenues.
5. Such a classification assumes that all employees within an industry are selected in the same way. Although this is a somewhat simplified picture of the labour market, I concentrate on industrial sectors because, first, employment relations are often negotiated at the industry level in coordinated market economies, including the Netherlands, and second, because industrial sectors have a 'dominant' group of employees with regard to the type of activities, job tasks and orientation towards production of goods or services. For these and other reasons, labour market sociologists often concentrate on industrial sectors (e.g. Caroll and Mayer 1986; DiPrete and Nonnemaker 1997; DiPrete et al. 1997; Farkas and England 1994; Stinchcombe 1979).
6. Using the commonly accepted criterion of extracting factors with an Eigenvalue larger than 1, an explorative factor analysis yielded three factors. This means that confirmatory and exploratory factor analysis yielded the same factor structure.
7. The correlation between the productive skills and the positional good dimension is 0.01, between productive skills and social closure −0.23, and between social closure and positional good −0.02.
8. This hypothetical combination of facts would be possible because of the imperfection of the labour market (Weiss 1995).
9. Focusing only on graduates from higher education obviously limits the dispersion in levels of attained schooling. Therefore, analysis of cross-setting variation in the strength of the education effect would be severely hampered. However, as I focus on the cross-setting variation in the mechanisms why education is beneficial, the theory can well be tested using data on graduates. We should only be aware of the fact that our results cannot be seen as representative for the total workforce.
10. I used the Stata packages xtmixed and xtlogit for these models.

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