Why does education pay off? Relations between institutional context and the mechanisms by which education pays off in the labor market

Bol, T.

Chapter 3

Signals and Closure By Degrees: The Education Effect in 23 European Countries

Abstract
Stratification research has extensively studied cross-national differences in the strength of the relationship between education and labor market outcomes. This research has mostly neglected the different mechanisms that could explain why education is rewarded. In this chapter, we argue that not only the strength of the relationship but also the mechanisms explaining why education is rewarded differ between countries. National institutions affect how employers see education and how workers signal their potential productivity. Empirically we focus on the partial effects of qualifications on top of years of education in twenty-three European countries. Using European Social Survey data (2008 and 2010), we find that strongly vocationally oriented and tracked educational systems have relatively strong net effects of qualifications on occupational status, which are explained by stronger signaling by qualification levels in those countries. Furthermore, in coordinated market economies, we find that vocational education leads to higher-status jobs relative to liberal market economies, a finding that is explained by higher levels of closure implemented by coordination institutions.

A slightly different version of this chapter is published as Bol, Thijs, and Herman G. Van de Werfhorst. 2011. "Signals and Closure By Degrees: The Education Effect Across 15 European Countries." *Research in Social Stratification and Mobility* 29(1): 119-132..

3.1 INTRODUCTION

For many years, social science research focused on the labor market returns to education and found indisputable proof of the link between a person's education and his or her position in the labor market: individuals with more education have, on average, a better labor market position than their less educated counterparts. In this chapter, our main focus is on occupational class position as the labor market outcome of education. Various other types of labor market outcomes (income, being employed, and so on) are also positively related to educational attainment. The education effect on labor market outcomes is thus evident, although earlier research showed that this relationship is institutionally embedded, and the strength and patterns differ between institutional contexts (Allmendinger 1989; Kerckhoff 1995, 2001). Institutions, both on the supply and demand side of the labor market, mediate the relationship between education and labor market position. The vocational orientation and the level of tracking in a country's educational system are institutional indicators that have been proven to influence the strength of the association between education and labor market outcomes. Shavit and Müller (1998) argue that in countries with a strong vocational sector, the incidence of unskilled workers is lower than in countries where education supplies school-leavers with general skills. Allmendinger (1989) finds the same results and furthermore argues that the level of standardization influences graduates' transition from school to work.

While these studies primarily addressed the influence of the institutional context on the strength and pattern of the education effect on labor market outcomes, we argue that the mechanisms that explain the education effect on labor market outcomes also differ across institutional settings. Although authors from different fields compare several of the possible mechanisms by which education pays off (e.g., Arrow 1973; Weiss 1995; Bowles, Gintis, and Osborne 2001), few embedded these mechanisms in an institutional perspective (however, see Van de Werfhorst 2011a, 2011b; Matković and Kogan 2011). Here, we will contextualize our findings by combining individual data with institutional characteristics. The baseline argument is that the explanation as to why education affects a person's socioeconomic attainment depends on his or her institutional context.

The empirical focus of this chapter will be the effects of different components of education, that is, the effects of degrees and years of schooling on occupational status position. By examining the partial effects of degrees controlled for years of schooling, and by examining whether these effects vary depending on institutions, we are able to examine whether institutions affect how education is used in the matching process of individuals to occupations. We address three research questions: (1) does the effect of degrees controlled for years of schooling differ across countries? (2) is the relative size of the effect of degrees controlled for years of schooling dependent on characteristics of the educational system and on labor market coordination? and (3) what do the findings tell us about theories that explain the education effect on labor market outcomes?

3.2 Theoretical background

While we know that education pays off, an interesting question remains unanswered: *why* do individuals with higher levels of schooling have more desirable work outcomes than those who are less educated? Various theories may explain this causal relation (for an overview, see Weiss 1995; Bills 2003). Here, our starting point is the effect of degrees controlled for years of schooling (also known as sheepskin effects) and what this design can tell us about mechanisms for the education effect on labor market outcomes. In section 3.3, we summarize three institutional indicators that can help contextualize these mechanisms.

3.2.1 Degrees controlled for years of schooling

Earlier, primarily economic, research showed that degrees have effects on labor market outcomes controlled for years of schooling (Hungerford and Solon 1987; Belman and Heywood 1991; Jaeger and Page 1996). The main proposition of these "sheepskin" studies is that if two individuals attained the same level of schooling (quantitatively measured as years of schooling), they should be equally skilled, equally productive, and thus equally rewarded in the labor market: diplomas are not expected to have an effect controlled for years of schooling. This idea reflects human capital theory, which argues that schooling provides skills and knowledge that are valued in the labor market (Becker 1964). It makes "education [...] an investment of current time and money for future pay" (Freeman 1986: 367). All of these economic studies, however, found large partial effects of degrees controlled for years of schooling. This non-linearity in the education effect has been interpreted as support for alternative explanations for the education effect than the one offered by human capital theory. Educational qualifications are held to represent "sheepskins" that are rewarded for reasons other than skills learned in school, for instance, because of the selection and sorting taking place in the educational system.

Although there are problems related to this interpretation of degree effects,[1] we believe that the sheepskin design is particularly useful in a cross-national comparison. The differential net effects of degrees across countries may reveal something about how education is used by employers and employees in different institutional contexts. Earlier results were primarily based on single-country studies, and although degrees have an effect controlled for years of schooling, the sizes of these effects differ considerably between countries (Park 1999; Gibson 2000; Ferrer and Riddell 2002; Mora 2003). The only comparative study of the non-linearity of the education effect of which we are aware found cross-national differences (Trostel 2005).

We argue that cross-national variation in the effect of degrees controlled for years of schooling can be expected on the basis of three theories: (1) differential signaling by means of degrees across countries, (2) differential closure by means of credentialization across countries, and (3) differential levels of a measurement problem of educational attainment by considering the years of schooling.

1. Several authors argue that sheepskin effects are not necessarily in opposition to human capital theory. Sheepskin effects can, for example, be explained by human capital models if there is a selection effect and the good learners are those who stay in school to earn a degree, or if the learning process itself is non-linear and individuals acquire more skills in the year that they obtain their degree than in the preceding years (e.g., Lange and Topel 2006; Flores-Lagunes and Light 2010).

Signaling productivity

Following the sheepskin literature, one possible explanation for degree effects is the idea of a degree as a signal. According to this theory, the main reason that degrees are important is the information asymmetry between employers and employees. Spence compares this asymmetry to buying a lottery ticket (1973: 356). Employers purchase lottery tickets without knowing their odds of success, as they have little knowledge about the future productive capacities of their potential employees. Even if the acquired skills are productive, employers will find it difficult to anticipate prospective hires' level of productivity. This information problem is solved by signals that potential employees send to employers. Individuals with more education signal a higher level of productivity.

Employers screen workers on the basis of the signals sent out by workers and applicants (e.g., Arrow 1973; Stiglitz 1975; Wolpin 1977). Degrees are particularly relevant as signals, as they represent unobserved skills of potential workers, such as ability, commitment, and perseverance. Cross-country variation in the effect of degrees controlled for years of schooling may be explained by the fact that degrees are not an equally strong signal in different countries. Degrees are more relevant than years of education to study cross-national variation; years of schooling can also function as a signal but largely independent of the institutional structure. Many of the discussed studies focus on earnings instead of occupational class position as the labor market outcome. The theoretical assumptions that underpin these studies are applicable to occupational class position as well, as it mediates the relationship between education and earnings.

Credentialing theory

A second explanation for cross-country variation in the non-linearity of the education effect is posited by credentialism (Berg 1970; Collins 1979). Credentialist theory argues that degrees function as a means of social closure. In the historical process of monopolizing professions, degrees and licenses were established to create exclusionary barriers (Freidson 1970; Abbott 1988; Brown 1995). The neutral concept of "degree" is replaced by the more loaded concept of "credential," a means of closure by which people are included not for what they can do but for what they possess. Credentials give entrance to occupations, and one's level of productivity is irrelevant for the returns that education brings on the labor market (Collins 1979: 21).

An obvious form of credential closure concerns legally constrained entrance to occupations by means of licensing or certification (Weeden 2002; Bills 2004; Kleiner and Krueger 2010). One cannot become a surgeon without the proper licenses and degrees. Less legalized forms of closure exist, for instance, those resulting from negotiations between employers' and employees' organizations concerning the protection of skilled workers. Trade unions tend to serve the interests of workers in the middle of the skills distribution (Checchi, Visser, and Van de Werfhorst 2010; Busemeyer and Iversen 2011). Access to skilled occupations is regulated through the bargaining of trade unions and employers, in particular for the skilled working class having vocational qualifications. Thus, degrees may be rewarded not only because of the potential productivity they signal but also because access to occupations is regulated on the basis of educational credentials.

Measurement problem
A final explanation for cross-country variation in the effect of degrees controlled for years of schooling is that years of schooling is a problematic measurement of educational attainment. When we attempt to compare degree effects across countries, we assume that years of schooling represents more or less the same educational level within and between countries. This assumption is not true: in Sweden, ten years of schooling lead to a different point in the educational system than in, for example, the Netherlands. After nine years of schooling in Sweden, one completes the "Grundskola," the primary education system that is identical for everyone. In the Netherlands, however, after nine years of schooling, one might be in any of five different tracks of various levels. One could argue that, especially in tracked educational systems, years of schooling is a poor measure of educational attainment: an equal number of years can lead to many different levels of education,[2] which may in turn bias our cross-national findings. Therefore, to rule out the measurement problem explanation, the institutional explanations should also be found if we only analyze one country and explore institutional variation between industries within this country.

3.2.2 Cross-country variation: the role of institutions

In this chapter, we study the influence that an educational system has on the size of the diploma effects controlled for years of schooling. The characteristics of educational systems influence individuals' behavior. The focus here will not be on the entire educational system but only on two aspects: the system's level of tracking and vocational orientation. Furthermore, we will focus on the level of labor market coordination to disentangle the signaling explanation from the credentialist argument.

Tracking and vocational orientation of the educational system
Tracking refers to the extent to which students are placed in separate educational tracks during secondary education. In countries where the educational system is tracked, separate school types exist with their own educational programs. In less tracked educational systems, students are located in the same school, even in the same class, independent of their ability level. Tracking influences the behavior of employers and employees because the signal of a degree from a diversified system may be stronger than that from a less diversified system. A greater number of tracks implies a greater diversity of degrees, each representing a different type of student. For employers, it is therefore easier to select employees on the basis of degrees in more tracked systems, and the sorting function of education increases. We thus hypothesize that the effect of degrees controlled for years of schooling increases with more tracked educational systems (*hypothesis 1*).

The second dimension on which educational systems differ is the form and extent of the vocational training. Education can either provide students with more general or more specific skills, their prevalence varying across educational systems. Educational systems differ in the organization of their vocational education (Shavit and Müller 1998; Müller and Gangl 2003). Systems that are highly vocationally

2. See also Table 2.3 in Chapter 2, where we show the opposite effect: the aggregated effects of years of education on occupational status (ISEI) are stronger in more tracked educational systems. While this finding does not reflect the effect of years of education controlled for degrees, it does show that years of education is not necessarily an inferior measure of education in more tracked educational systems.

oriented provide students with job-relevant skills, while less vocationalized systems produce more generally skilled employees. In highly vocational educational systems, students obtain very specific degrees, and it is especially these degrees that are strong signals for employers. The argument for this institutional characteristic is the same as for tracking: degrees are more informative for employers if they are differentiated by a large number of vocational programs. The vocational characteristic adds the dimension of the specificity of skills. In a tracked educational system, degrees from different tracks are likely to signal more general skills, while the assumption is that vocational degrees, and thus more specific skills, are a stronger signal. Degrees provide better information regarding the future productivity of the vocationally trained. In countries where education is more vocational, we expect that degrees are more important for occupational attainment (*hypothesis 2a*).

We furthermore analyze this second hypothesis by looking at between-industry variation in one country: the Netherlands. As argued above, one reason for country variations in the partial effect of degrees controlled for years of schooling may be that countries differ in the extent to which years of schooling adequately measures educational attainment. To avoid this measurement problem, we analyze one country and compare industries that differ with respect to their vocational orientation, assuming that workers' qualifications in more strongly vocationally oriented industries more clearly represent their potential productivity than in less vocationalized industries. This assumption leads to the hypothesis that degrees have a stronger partial effect on occupational status in industries that can more strongly rely on a vocationally educated workforce (*hypothesis 2b*).

Labor market coordination

While in more vocationally oriented educational systems, degrees may be stronger indicators of productivity, it is true that those countries are often also the ones with higher levels of labor market coordination between employers and employees. In addition to studies that find that credential closure takes place at the level of occupations (Weeden 2002), it is plausible that a society's level of coordination of employment relations also affects its level of regulation of access to occupations anticipated by credentialist theory. In coordinated market economies, the tri-partite negotiations between trade unions, employers' organizations and the state concern a variety of issues, including training, selection and employment protection. For negotiations on such a combined set of complex issues, it is crucial that the coordination of employment relations takes place in a setting outside of the market (Soskice 1994, Culpepper and Finegold 1999). This feature distinguishes coordinated market economies from liberal market economies.

The inclusion of skilled workers in the labor market, especially those with a vocational qualification, is considered to be most successful in a context where employment protection is guaranteed (Estevez-Abe, Iversen, and Soskice 2001; Breen 2005). Only under the condition of sufficient employment protection will employees be willing to invest in vocational training, as vocational training implies the acquisition of specific skills that reduce the range of occupations they can access (Iversen and Soskice 2001; however, see Streeck 2011). With respect to credentialism, we expect that more coordination will lead to a greater regulation of the criteria that are used for selection, including the regulations around the protection and inclusion of people with vocational qualifications. In coordinated market economies, vocational

qualifications are an important means by which employers, trade unions, and the state regulate workers' access to occupations. In more liberal market economies, however, the regulation of the skill acquisition in vocational programs is absent, and vocational degrees do not serve particularly well as credentials. As a result, in coordinated market economies, vocational degrees guarantee access to occupations of a higher status than in liberal market economies (*hypothesis 3*).

Given that this credentialist argument differs from the skills-producing characteristic of vocationally oriented schooling systems, it is important to include both the vocational orientation of the system and the level of labor market coordination in the analysis. To date, only one study has examined the impact of educational institutions and coordination institutions simultaneously in a quantitative manner (Andersen and Van de Werfhorst 2010). However, that study was concerned with the varying strengths of effects of education across countries and was not aimed at contextualizing the mechanisms by distinguishing between the effects of years of schooling and degrees.

3.3 Data and methods

For the main analysis, data from the European Social Survey (ESS) of 2008 and 2010 are used.[3] The ESS is designed to gather data about wide-ranging topics—from political habits to education and attitudes about immigrants—in most EU countries, of which 23 entailed the relevant information for our comparative research. In the single country study, we selected the Dutch data from the ESS of 2004 and the ESS of 2006.

3.3.1 Country comparative design

For the cross-country design, we fit a two-level random intercept model to study the non-linearity of the schooling effect in Europe. Occupational status is regressed on years and level of education while taking specific institutional characteristics at the country level into account. Only individuals between the ages of 24 and 65 who were employed at the time of the survey are included in the research.

The dependent variable is the International Socio-Economic Index of Occupational status (ISEI), a variable that defines someone's position in the occupational structure (Ganzeboom, De Graaf, and Treiman 1992). The central idea of the measure is that occupation is the bridge between education and income and is therefore a good measure of socio-economic status. The ESS does not include individual wages or earnings, which is the dependent variable used in earlier research to test sheepskin effects. However, occupational status is a useful measure for our purposes, as the impact of national institutions on the matching process of individuals to jobs refers to access to particular occupations, not necessarily to wage levels. Occupational status measured with ISEI was developed for comparative research and is thus more suitable for our study. ISEI is measured on a scale from 16 (lowest socio-economic status) to 90 (highest socio-economic status).

The main independent variables at the individual level are the total number of

3. In an earlier version of this chapter, we used data of the ESS of 2006. These data were only available for 15 countries; hence, in this chapter, we only present the results with the newer data. In Appendix E, the results for the smaller sample using ESS 2006 are shown. The findings are comparable to our more recent findings with data from the ESS of 2008 and 2010.

years of schooling and the educational level. In contrast to the first studies on the non-linearity of the education effect, years of schooling is self-defined rather than calculated from information regarding the highest educational level. We classify educational qualifications using the newly developed ES-ISCED, which is an adjustment of ISCED with a more evident classification of vocational and general types of education. ES-ISCED was developed in a comparative project relying on country experts and uses the country-specific educational codes in the ESS data to achieve a harmonized classification of education (Schneider 2010). Categories I and II are merged to represent lower secondary education or below. Category IIIa refers to upper secondary education of a general nature on the university track, while category IIIb refers to upper secondary education with a focus on vocational training. The fourth category, ES-ISCED IV, is merged with V1 and represents all post-secondary education and the first stage of tertiary education. The final category, V2, refers to the second stage of tertiary education. Age and gender (female = 1) are used as individual level control variables.

At the country level, two variables measure institutional variability with respect to education: the level of tracking and the vocational specificity of a country's educational system. Vocational orientation is measured by combining the data on the percentage of students who are enrolled in secondary vocational education from two sources: the OECD and UNESCO. Tracking is also based on OECD data; here, the measure is retrieved through factor analysis over three indicators: the age of first selection, the number of tracks at 14 years of age and the total number of tracks in secondary education. A more detailed description of the construction of these two indicators can be found in Chapter 2.

The level of labor market coordination is, just as the level of tracking and vocational orientation, a factor score that we obtained through principal factor analysis. This variable is based on the country scores for two indicators (OECD 2004): union coverage (%) and the level at which coordination takes place in a labor market (on a scale of 1 to 5). The official OECD data were supplemented with information obtained from Cazes and Nesporova (2004) and Visser (2011). The country level indicators of tracking and the indicator of labor market coordination can be found in Appendix D. Summary statistics on all of the variables are shown in Table 3.1.

3.3.2 Single country study

The modeling strategy for the single country study is the same as the country comparative design, with the exception that the higher level in this multilevel random intercept model does not refer to the countries but to industries within a country (the Netherlands). Individuals are nested within 48 different industries, which are classified in accordance with the NACE v1.1 categories.[4] Only industries that had at least 5 observations are included in the analysis. All of the individual-level data are the same as in the country comparative design. The sample again includes only those respondents who are between the age of 24 and 65 and are employed. Vocational training at the industry level is measured as the aggregate percentage of graduates who said that job-specific skills are learned in school and is based on Dutch school-leaver surveys for the years 1999-2003 (HBO-monitor and WO-monitor) gathered by the

4. For more information on the categorization of the industries, see ec.europa.eu/eurostat, last accessed May 10, 2010.

Research Center for Education and the Labor Market (ROA). Summary statistics for this design can be found in the table below.

Table 3.1: Descriptive statistics

	Cross country data (ESS 2008/2010)				*Dutch single country data*			
	Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.
ISEI	43.14	16.86	16	90	47.27	16.11	16	90
Years of Education	13.08	3.75	0	30	13.74	4.10	1	28
Educational level (ES-ISCED)								
ES-ISCED I/II	0.27	0.45	0	1	0.30	0.46	0	1
ES-ISCED IIIb (Vocational)	0.20	0.40	0	1	0.24	0.43	0	1
ES-ISCED IIIa (General)	0.21	0.40	0	1	0.18	0.38	0	1
ES-ISCED IV/V1	0.19	0.39	0	1	0.18	0.39	0	1
ES-ISCED V2	0.13	0.33	0	1	0.10	0.30	0	1
Age	44.63	11.83	24	65	44.12	11.39	24	65
Female	0.55	0.50	0	1	0.54	0.50	0	1
Tracking	0.04	0.90	-1.08	1.79				
Vocational orientation	0.47	0.64	-0.70	1.74	45.12	9.55	25.71	66.67
Labor market coordination	-0.03	0.60	-0.89	1.22				

SOURCE. – Author's calculations using ESS. The empty cells for the Dutch country study reflect the absence of the indicators.

3.4 Results

3.4.1 Country comparison

The empirical results are presented in eight models, each adding more explanatory variables at both the individual and country level. In the first model, only years of education is used as a predictor of occupational status. The second model adds dummies for the highest attained degree. In Models 3 to 5, country-specific variables concerning the educational system and the labor market, as well as the cross-level interaction effects between these country-level variables and the individual-level measurements of degrees and years of schooling, are included.

In Model 1, we see that years of education have a large and significant effect on an individual's occupational status position, as expected. Each year of schooling adds 2.59 on the scale of occupational status. Age is positively related to occupational status, while the effect of gender on ISEI is not significant. We furthermore find that, although the vast majority of variance can be found at the individual level within countries (approximately 97 percent), the between-country variation is significant. This finding implies that there is a significant variance between countries along the grand mean intercept.

Model 2 adds the dummy variables for educational level, thereby completing the

Table 3.2: Random intercept models with ISEI as dependent variable

	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Individual Level									
Age		0.080***	0.076***	0.076***	0.074***	0.079***	0.075***	0.078***	0.074***
		(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Female		0.052	-0.064	-0.064	-0.065	-0.025	-0.085	-0.057	-0.075
		(0.177)	(0.166)	(0.166)	(0.166)	(0.165)	(0.166)	(0.165)	(0.166)
Years of education		2.590***	1.213***	1.213***	1.198***	1.577***	1.220***	1.583***	1.207***
		(0.025)	(0.034)	(0.034)	(0.034)	(0.041)	(0.034)	(0.041)	(0.034)
Highest level of education									
ES-SCED I/II			ref.	ref.	ref.	ref.	ref.	ref.	ref.
ES-ISCED IIIb			2.699***	2.701***	3.063***	2.236***	2.938***	2.133***	3.200***
			(0.306)	(0.307)	(0.310)	(0.426)	(0.311)	(0.434)	(0.314)
ES-ISCED IIIa			6.680***	6.682***	6.480***	4.002***	6.435***	3.557***	6.355***
			(0.306)	(0.307)	(0.306)	(0.376)	(0.309)	(0.386)	(0.309)
ES-ISCED IV/V1			12.899***	12.904***	13.030***	9.741***	12.915***	9.469***	13.085***
			(0.352)	(0.353)	(0.354)	(0.461)	(0.357)	(0.470)	(0.358)
ES-ISCED V2			22.598***	22.602***	22.660***	18.571***	22.394***	18.268***	22.503***
			(0.432)	(0.433)	(0.431)	(0.541)	(0.434)	(0.547)	(0.433)
Country Level									
Level of tracking				0.479	-0.654				-0.290
				(0.932)	(0.905)				(0.928)
Level of vocational orientation				-0.387		7.720***		7.681***	
				(1.243)		(1.154)		(1.146)	
Labor market coordination				-0.047			2.450*	1.161	2.599*
				(1.275)			(1.326)	(1.210)	(1.336)
Cross level Interactions									
Years of education * Tracking					-0.062				-0.095
					(0.039)				(0.070)
ES-SCED I/II * Tracking					ref.				ref.
ES-ISCED IIIb * Tracking					1.044***				1.236***
					(0.329)				(0.330)
ES-ISCED IIIa * Tracking					3.803***				3.482***
					(0.350)				(0.358)
ES-ISCED IV/V1 * Tracking					2.671***				2.783***
					(0.390)				(0.392)
ES-ISCED V2 * Tracking					1.889***				2.330***
					(0.490)				(0.494)

Table 3.2 continued

	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Years of education * Vocational						-0.889***		-0.900***	
						(0.056)		(0.057)	
ES-SCED I/II * Vocational						ref.		ref.	
ES-SCED IIIb * Vocational						1.823***		2.342***	
						(0.503)		(0.513)	
ES-SCED IIIa * Vocational						5.804***		6.174***	
						(0.480)		(0.495)	
ES-SCED IV/V1 *Vocational						7.192***		7.816***	
						(0.628)		(0.650)	
ES-SCED V2 * Vocational						9.316***		9.548***	
						(0.712)		(0.724)	
Years of education * Coordination							-0.275***	-0.076	-0.282***
							(0.058)	(0.059)	(0.059)
ES-SCED I/II * Coordination							ref.	ref.	ref.
ES-SCED IIIb * Coordination							2.612***	1.429**	2.454***
							(0.521)	(0.529)	(0.523)
ES-SCED IIIa * Coordination							-1.154**	-2.652***	-0.315
							(0.497)	(0.510)	(0.506)
ES-SCED IV/V1 * Coordination							0.818	-1.037*	1.064*
							(0.571)	(0.588)	(0.575)
ES-SCED V2 * Coordination							3.766***	1.534*	3.825***
							(0.717)	(0.727)	(0.722)
Constant	43.197***	5.739***	16.810***	16.980***	17.005***	13.206***	16.801***	13.314***	16.930***
	(0.598)	(0.776)	(0.903)	(1.065)	(0.882)	(0.983)	(0.896)	(0.969)	(0.877)
σ^2u (countries)	7.95***	7.23***	11.89***	11.71***	11.04***	9.22***	11.57***	8.71***	10.78***
	(1.210)	(1.101)	(1.783)	(1.757)	(1.658)	(1.391)	(1.737)	(1.316)	(1.620)
σ^2e	276.23***	192.74***	169.76***	169.76***	168.66***	167.66***	168.92***	166.87***	168.13***
	(1.235)	(0.861)	(0.759)	(0.759)	(0.754)	(0.749)	(0.755)	(0.746)	(0.751)
ICC (countries)	0.028	0.036	0.065	0.065	0.061	0.052	0.064	0.050	0.060
-2LL	212,004	202,996	199,828	199,828	199,664	199,512	199,704	199,390	199,584
N (countries)	23	23	23	23	23	23	23	23	23
N (individuals)	25,053	25,053	25,053	25,053	25,053	25,053	25,053	25,053	25,053

SOURCE. – Author's calculations using the ESS of 2008, supplemented with data from the ESS of 2010 for Bulgaria, Finland, Great Britain, and Sweden.
NOTE. – Dependent variable is ISEI. Standard errors are listed in brackets under coefficients.
* p<0.10, ** p<0.05, *** p<0.01

standard model to study the non-linearity in the education effect. We find that the added effects of degrees are significant and increase as the educational level increases. This finding implies that having a tertiary degree (ES-ISCED categories IV/V1 and V2) increases occupational status by 12.90 or 22.60 points controlled for years of schooling, with lower secondary schooling (ES-ISCED category I/II) as a reference. Our data shows the same results as most sheepskin studies: degrees have an effect even after controlling for years of schooling and therefore indicate that the effect of schooling on occupational status is non-linear; the effect of education increases as the educational level increases. By adding dummies for degrees, the effect of years of schooling on ISEI is now three times as small. Around the mean intercept of the different countries, there is a variance of 11.89, indicating that countries differ and that sheepskin effects are not the same in all countries. This finding is significant in and of itself; however, it is interesting to study the reasons behind it.

In Models 3 to 5, our institutional explanation—characteristics of educational systems—is studied by adding contextual variables at the country level. In Model 3, the indicators of tracking, vocational orientation and labor market coordination are added, all three having a non-significant effect on an individual's status position. This finding is not surprising; we do not expect that an educational system or a labor market in itself influences the response variable. What is essential for our hypotheses 1 and 2a is the cross-level interaction effect between educational degrees and the level of vocational orientation and tracking, respectively. These two hypotheses are investigated in Models 4 and 5.

First, the cross-level interactions between the level of tracking and individual educational degrees are added. Degree effects are larger in countries with higher levels of tracking, although the effect sizes of the interaction terms differ. While all degrees have a significantly stronger effect on occupational status when there is a higher level of tracking, the effects for ES-ISCED IIIa and IV/V1 are larger. Furthermore, we do not find a significant interaction effect between the level of tracking and years of education, indicating that it is not so much the total effect of education but rather educational degrees in particular that positively influence occupational status. Overall, the results show that the effect of educational qualifications on occupational status increases when an educational system's level of tracking increases. We therefore find support for hypothesis 1, which argued that the effect of educational degrees on occupational status is larger in more tracked educational systems.

In Model 5, the interaction effects of the educational degrees yield similar findings: when an educational system is more vocationally oriented, the effect of an individual's highest level of education on occupational status outcomes increases. The effects of ES-ISCED IIIa and IV/V1 degrees on occupational status are significantly stronger in more vocationally oriented educational systems. Moreover, we find that years of education is negatively related to the level of vocational orientation. This finding shows that the total effect of education (which consists of both a degree and/or a certain number of years of education) is smaller than one would predict on the basis of the large degree effects, which range from 1.82 (ES-ISCED IIIb) to 9.32 (ES-ISCED IV/V1). What we find, however, is that the stronger education effect in more vocationally oriented educational systems (see, e.g., Shavit and Müller 1998) is largely due to the effects of degrees instead of the more commonly used measure of years of education. Education yields a higher return on investment in more vocationally

oriented systems; however, our results show that this larger payoff is better explained by the role of educational degrees than the level of accumulated human capital, as traditionally measured by years of education. We therefore accept hypothesis 2a, which argued that in vocationally oriented systems, selection takes place more on the basis of degrees than years of education.

Models 4 and 5 both show that there is a significant relationship between educational systems and the effect of degrees controlled for years of schooling, and both are a better fit than Model 2, thus signifying that it is important to take these cross-level interactions into account. However, these degree effects could both be ascribed to the signaling and credentialing function of educational degrees. In the following series of models, we attempt to filter out the credentialist explanation of our findings by examining our third hypothesis.

In Models 6 to 8, we analyze hypothesis 3, which states that in more coordinated market economies, individuals with vocational degrees have a higher occupational status than in liberal market economies. The level of labor market coordination and cross-level interactions between this indicator and the two measures of education are added to Model 6. The results show that post-tertiary degrees pay off more when higher levels of coordination exist. However, the most notable finding is the difference between general and vocational upper secondary degrees (ES-ISCED IIIa and IIIb, respectively): while general upper secondary degrees negatively relate to labor market coordination, vocational upper secondary degrees yield higher returns on investment in more coordinated market economies. We believe that this finding reflects the fact that vocational degrees function better as credentials in such systems. Vocational credentials are especially effective in securing and maintaining social closure to occupations when there are strongly institutionalized negotiations between trade unions, employers, and the government, as is the case in highly coordinated market economies. For this reason, we find a higher degree effect for vocational qualifications in coordinated market economies (see also Chapter 5). We do not suggest that vocational degrees do not impart any skills at all; rather, we posit that the stronger effect of vocational qualifications in coordinated compared to liberal market economies is at least partly explained by a credentialist argument.

We then control these findings to determine whether the cross-level interaction persists when we add the cross-level interactions between vocational orientation and educational degrees (Model 7) and level of tracking and educational degrees (Model 8). In Model 7, we find that the results of the previous models remain the same: the more vocationally oriented an educational system is, the larger the effect is of degrees controlled for years of schooling. This finding holds true for the level of tracking, as shown in Model 8. In both models, the cross-level interactions between degrees and labor market coordination persist, thereby providing support for our third hypothesis that states that vocational qualifications function better as entrance-restricting credentials when there is a high level of labor market coordination. An alternative explanation for the presence of degree effects, namely, that the findings are biased by measurement problems that occur in more stratified educational systems, is discussed using the single-country data.

3.4.3 Results of the single-country analysis

Our single-country analysis has a comparable design to the previous analyses, although

it uses fewer models because we can only insert one higher-level variable: the level of vocational orientation.

In Table 3.3, we see that the effect of educational degrees controlled for years of schooling is large and significant in Model 1. The explanatory power of years of schooling is nearly three times as small after the dummies for degrees are introduced in Model 2, and the effect of degrees on occupational status increases as the level of the degree increases. In the case of the Netherlands, we find that degrees have a large and significant effect controlled for years of schooling. In comparison to the cross-country model, females have a worse outcome than males. The industry level is important to consider; in the null model, approximately 29% of the variance occurs between industries, while 71% of the variance results from individual within-industry differences in occupational status. Industries matter; thus, it is logical to add contextual variables at the industry level to determine whether they account for the variance at the industry level.

Once again, we do not expect the industry-level indicator of the importance of vocational training to have a direct effect on individual occupational status; following hypothesis 2b, we are more interested in the way in which the importance of vocational training interacts with the variable of highest earned degrees. The results show that the effect of educational degrees on occupational status (and thus the non-linearity in the education effect) increases as the importance of vocational programs in a certain industry increases. Even more noteworthy is that this effect is stronger for higher degrees (with the least difference between ES-ISCED IV/V1 and V2) and that it has no effect for those workers who only complete secondary schooling. Because their education provides them with a degree that signals a lack of specific skills, it comes as no surprise that the effect of these degrees does not increase when industries are more vocational. These findings from Model 3 persist in Model 4, where we add the interaction term between years of schooling and vocational orientation. We therefore accept hypothesis 2b: the effect of degrees increases the more vocationally oriented the industry is.

Because all industries are within one country and thus one educational system, the claim that the effect of degrees controlled for years of schooling is caused by measuring problems is refuted. Although one may argue that years of schooling is an imperfect measure—within the highly tracked Dutch educational system, 12 years of schooling could include several switches between tracks and thus different destinations—the measure is a far better indicator than in the cross-country design. Evidence that vocational orientation is significant in the Netherlands lends support to the idea that vocational orientation is also a relevant contextual variable across countries and that its influence on degree effects is not entirely caused by measurement problems. The results of one case provide us further support for an institutionalist interpretation of the cross-country results, as the effects of educational degrees are stronger when there is greater differentiation.

3.5 CONCLUSION

The goal of this chapter was to determine whether the effect of degrees in addition to years of schooling (sheepskin effects) on occupational status varies across countries

Table 3.3: Random intercept models for the Netherlands with ISEI as dependent variable

	Model 0	Model 1	Model 2	Model 3	Model 4
Individual Level					
Age		0.008	0.030	0.030	0.029
		(0.024)	(0.024)	(0.023)	(0.024)
Female		-1.392**	-0.935*	-0.810	-0.833
		(0.592)	(0.561)	(0.560)	(0.561)
Years of education		1.521***	0.526***	0.528***	-0.0258
		(0.076)	(0.096)	(0.096)	(0.468)
Highest level of education			ref.	ref.	ref.
ES-SCED I/II			4.967***	0.789	2.362
			(0.760)	(3.828)	(4.042)
ES-ISCED IIIb			9.589***	-2.006	0.130
			(0.866)	(4.163)	(4.522)
ES-ISCED IIIa			14.11***	1.470	4.667
			(0.952)	(3.935)	(4.741)
ES-ISCED IV/V1			17.16***	-0.715	4.094
			(1.274)	(4.929)	(6.335)
ES-ISCED V2					
Industry Level					
Vocational orientation				-0.271**	-0.391**
				(0.117)	(0.154)
Cross level Interactions					
Years of Schooling * Vocational					0.0121
					(0.0100)
ES-SCED I/II * Vocational				ref.	ref.
ES-SCED IIIb * Vocational				0.103	0.0688
				(0.0860)	(0.0906)
ES-SCED IIIa * Vocational				0.268***	0.221**
				(0.0926)	(0.100)
ES-SCED IV/V1 * Vocational				0.288***	0.219**
				(0.0851)	(0.103)
ES-SCED V2 * Vocational				0.401***	0.296**
				(0.105)	(0.137)
Constant	44.945***	26.442***	31.803***	43.083***	48.667***
	(1.349)	(2.016)	(1.960)	(5.173)	(6.941)
σ^2u (industries)	74.98***	47.04***	36.27***	34.44***	34.50***
	(17.102)	(11.053)	(8.802)	(8.482)	(8.442)
σ^2e	185.84***	156.23***	140.21***	139.06***	138.92***
	(5.533)	(4.655)	(4.167)	(4.142)	(4.143)
ICC (industries)	0.287	0.231	0.206	0.198	0.199
-2LL	18,680	18,270	18,014	17,994	17,992
N (industries)	48	48	48	48	48
N (individuals)	2,303	2,303	2,303	2,303	2,303

SOURCE. – Author's calculations using the Dutch sample from the ESS of 2006.

NOTE. – A dummy of the ESS wave was included to check the dependence of this wave. Only in Model 1 a significant negative effect was found. Dependent variable is ISEI. Standard errors are listed in brackets under coefficients.

* p<0.10, ** p<0.05, *** p<0.01

and how this effect is related to structural institutional settings—in this case, the educational system and the level of labor market coordination. The rationale behind this hypothesis was that the mechanisms that explain the education effect on labor market outcomes are not equally important across institutional settings. The effects of degrees controlled for years of schooling give insight into the cross-country or cross-industry variation in the effect of degrees and therefore support any theory that states that a degree increases one's labor market position. Both signaling theory and credentialist theory argue that educational degrees are important in explaining the educational payoff in the labor market. This finding contrasts with human capital theory, which attaches no importance to educational degrees. In this chapter, we sought to investigate which of these three explanation—human capital theory, signaling, and credentialism—is most important. Our empirical analyses suggest two main results.

First, we found that sheepskin effects are stronger when educational systems are more tracked and vocationally oriented. These degree effects can be explained by both signaling and credentialist theories. When educational systems are more differentiated, degrees are stronger signals. Alternatively, one can argue that in more differentiated educational systems, degrees are often occupation-specific and hence more effective in regulating workers' entrance to closed occupations. While the results clearly point to the importance of cross-country variation in the salience of different theoretical mechanisms, a critique to this finding is that this variation arises from problems with the comparability of years of education. We therefore studied one specific country case and found that vocational orientation interacts positively with degree effects at the industry level in the Netherlands. Because all industries are in the same country and thus the educational system is constant, years of schooling is a far better comparable measure, and the interpretation of the data is less vulnerable to errors. Our findings at the industry level lend support to the original explanation: in industries that are highly vocational, we find stronger sheepskin effects.

Second, we found that vocational qualifications are associated with a higher occupational status in more coordinated market economies. The general qualifications from the same level do not interact positively with labor market coordination, showing that it is not so much an argument about the level of the educational degree, but more about the focus of the educational degree. We argue that this positive interaction between labor market coordination and vocational degrees is best explained by credentialist theory. In more coordinated market economies, trade unions, employers, and the state use vocational qualifications to regulate access to occupations, as vocational degrees are often legally required to practice an occupation. Such access restrictions are absent in liberal market economies, thereby making vocational credentials less effective is securing social closure. We will elaborate on this argument in Chapter 5, where we investigate the use of vocational degrees in establishing closure more extensively.

In strongly vocationally oriented and tracked schooling systems, we find that the relatively strong net effects of qualifications on occupational status are explained by the stronger signaling effect of qualification levels in those countries. These results do not allow us to distinguish a signaling explanation from a credentialing explanation. We believe, however, that the stronger net effect of vocational degrees in more coordinated market economies is explained by higher levels of closure implemented by coordination institutions. It is important to note that we do not suggest that the human capital model is irrelevant in countries with a highly differentiated educational

system or coordinated labor market. Instead, our main argument is that the stronger education effect in such countries is at least partly due to the important role of vocational educational degrees as both credentials and signals.