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

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Chapter 2

Educational Systems and the Trade-off Between Labor Market Allocation and Equality of Educational Opportunity

Abstract
Educational systems with a high level of tracking and vocational orientation have been shown to improve the allocation of school-leavers in the labor market. However, tracked educational systems are also known to increase the inequality of educational opportunity. This presumed trade-off between equality and labor market preparation is rooted in two different perspectives of the origins of differentiation in educational systems in the 19th century. Tracking was seen both as a way to prepare students for an industrializing labor market and as a way for the elite to formalize social distances in the educational system. We empirically study the trade-off with newly developed country level indicators for tracking and vocational orientation. Our country level regressions largely support the existence of the trade-off.

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2.1 INTRODUCTION

In the past decade, strong contributions have been made in the field of comparative education research. Several studies investigated the cross-national differences of the educational payoff in the labor market (Breen and Buchmann 2002; Müller and Gangl 2003; Müller 2005) and the effects of social origin on educational outcomes (Hanushek and Woessmann 2006; Jenkins, Micklewright, and Schnepf. 2008). In attempting to explain these differences, scholars have increasingly acknowledged the importance of cross-national variation in educational systems (Maurice, Sellier, and Silvestre 1986; Allmendinger 1989; Kerckhoff 1995; Shavit and Müller 1998; Müller and Gangl 2003; Shavit, Arum, and Gamoran 2007; Pfeffer 2008; Horn 2009; Bol and Van de Werfhorst 2011b). Educational systems are compared according to (1) the placement of students in different educational tracks[1] and (2) the extent to which educational systems provide their students with vocational skills (e.g., Kerckhoff 2001).

The first dimension, tracking, refers to the existence of different educational programs at the same point in an educational trajectory.[2] These programs are hierarchically ranked, and it is clear which is higher and which is lower (Allmendinger 1989). Tracking predominantly takes place in secondary education, although curriculum-tracking exists in post-secondary education as well. The second dimension in which educational systems differ is their level of vocational orientation, that is, the extent to which education provides students with vocational skills and the specificity of these skills. Education may supply students with general or specific skills, and the balance between these two differs across educational systems. The specificity of skills conferred through education is primarily associated with upper secondary vocational education, educational programs that emphasize work-specific skills and where employers often influence the curriculum. Our main research question is how these two dimensions are related to two central educational stratification outcomes: the allocation of students to the labor market and the equality of educational opportunity.

Our contribution to the current literature is twofold. First, we will propose new measures for tracking and vocational orientation. Although many scholars recognize the importance of these two dimensions of educational systems, little effort is made to use comparable measures across studies. For each study, new indicators are used; they are sometimes developed for the specific study and sometimes based on existing indicators provided by statistical agencies. The classifications utilized are often poorly documented so that other researchers cannot replicate the findings or use the same classifications in their research. With the increased availability of data regarding educational systems, such as those provided by the Organization for Economic Cooperation and Development (OECD), Eurydice, and the United Nations

1. In defining what an educational track is, we follow UNESCO's definition of educational programs: "Educational programmes are defined on the basis of their educational content as an array or sequence of educational activities which are organized to accomplish a pre-determined objective or a specified set of educational tasks" (UNESCO 2006: 12).

2. Our focus here is on between-school type differentiation instead of within-school type differentiation: the separation of students in different ability groups within the same educational setting. Arguably, educational systems that separate students in different school types have more manifest and institutionalized forms of ability grouping than within-school type differentiation because such systems are characterized by separation for the full curriculum, often in separate school organizations, over multiple years.

Educational, Scientific and Cultural Organization (UNESCO), it is now possible to rank countries on the two dimensions of educational systems (tracking and vocational orientation) and to make our classifications available to the field.

Second, we empirically study a potential trade-off between two important functions of education: the allocation of students to the labor market and equality of educational opportunity. Although tracking, and especially the vocational orientation of educational systems, is known to ease the school-to-work transition (Shavit and Müller 2000), several studies point to more controversial outcomes of highly differentiated educational systems. In more tracked educational systems, the effect of social origin on educational performance tends to be stronger (Brunello and Checchi 2007; Van de Werfhorst and Mijs 2010). While there are numerous studies that focus either on labor market allocations or the (in)equality of educational opportunities, we focus on both simultaneously. By using country-level regressions, we are able to estimate the effects of our new indicators of educational systems on a large variety of dependent variables. Our results confirm the existence of the trade-off, as they reveal that educational systems that are more tracked or vocationally oriented both enhance the allocation of students to the labor market and increase the inequality of educational opportunity.

We furthermore embed this trade-off in a literature that focuses on the origins of differentiation in educational systems. Differentiation in educational systems is both a result of (1) a growing need for technical and vocational skills and (2) the need to emphasize distance between social groups. The implementation of more educational tracks was not only driven by changes in demand for more specific skills but was also meant to institutionalize social class differences.

The chapter proceeds as follows. First, we discuss the origins of differentiation in educational systems (2.2) and relate these to the trade-off between labor market allocation and equality of educational opportunity. Next, we formulate hypotheses on the relationship between educational systems and indicators that measure both sides of the trade-off (2.3). In section 2.4 and 2.5, we discuss our methods and data. We then discuss our findings in section 2.6 and offer our conclusions in section 2.7.

2.2 Differentiation in educational systems: a brief history

While the cross-national variety in educational systems is the topic of numerous studies, relatively little attention has been given to the question of how educational systems have arisen. Before we propose hypotheses on the potential existence of a trade-off between labor market allocation and the equality of educational opportunity, we are interested in how the two studied dimensions, vocational orientation and tracking, developed historically. Our empirical interest concerning the imbalance between the goals of equality and efficient allocation to the labor market can be placed in the context of how these institutions have developed in the past 150 years.[3]

3. Our focus here is on tracking and vocational education in secondary education. Differentiation is most common in secondary education. Although there was differentiation in primary education in the 19rh century, this practice has been almost completely abolished. Recent studies show that as a consequence of ongoing educational expansion, there is some differentiation in higher education as well (Shavit, Arum, and Gamoran 2007). However, differentiation remains most prominent in secondary education.

Differentiation in educational systems, both in the form of separate educational tracks and vocational education, coincided with educational expansion in the 19th century (Archer 1979: 144). During this period, secondary education shifted from being an institution for the elite to an institution for the masses (Boli, Ramirez, and Meyer 1985). With educational expansion, decentralized educational organizations were replaced by a state-regulated and often differentiated educational system.

As more students entered secondary education, the demand for differentiation between school types also increased. Already in the 19th century, students from several European countries were separated into different types of educational institutions. In his study on vocational education, Benavot (1983) argues that in the early 20th century, most European educational systems had three distinct tracks: "first, a traditional form of highly selective institutions geared towards children of upper class background; second a growing number of modern schools with generalized secondary programs [...]; and third, a multiplicity of technical-vocational courses and industrial schools" (Benavot 1983: 64-65). Historically, educational systems became more differentiated in the late 19th century, but why did this transformation take place? Kelly and Price (2011) argue that the implementation of tracking in educational systems can be explained both by technical-functional arguments and theories that argue that differentiation is intended to emphasize social class differences.

The dominant technical-functional explanation is that the differentiation in educational systems is a consequence of the industrial revolution and the growing demand for vocationally skilled workers. This functionalist argument is based on the proposition that changes on the supply side of the labor market are driven by changes on the demand side. The rise of vocational education programs can be seen as a direct response to an increasing demand for technically skilled labor. More generally, from a functionalist perspective, educational expansion is understood to be a consequence of the industrial revolution (Davis and Moore 1945; Bell 1974; Goldin and Katz 2008). The differentiation between technical and general tracks was functional, as a growing number of occupations demanded complex skills. Skill specialization, crudely between technical and more general skills, led to differentiation (Benavot 1983; Grubb 1985). The origin of differentiation in educational systems is thus explained by technological changes that changed the skill demands in the labor market.

A more critical strand of research disagrees with this functionalist line of reasoning and argues that differentiation in education is meant to institutionalize the distance between social classes (Marshall 1950; Bowles and Gintis 1976; Collins 1979; Lucas 1999). With educational expansion, the clear distinction between the educated elite and non-educated lower classes slowly disappeared, and thus separated tracks were established to emphasize differences. Marshall argues that "a divided educational system, by promoting both intra-class similarity and inter-class difference, gave emphasis and precision to a criterion of social distance" (Marshall 1950: 112). While differentiation in educational systems might be legitimated by technological changes, the underlying motives were arguably class-related. Vocational programs, for example, originated partly because industrialists wanted their low-skilled employees to know their place in the division of labor (Benavot 1983). Educational systems are systems of stratification, and the implementation of vertical differentiation between tracks legitimizes differences between social classes in a society.

Although in the late 19th century, all Western societies implemented some forms of

differentiation, there is currently strong cross-national variation in the level of tracking and vocational orientation. This variation in educational systems is argued to be caused by country variation in negotiations between supply- and demand-side actors (Thelen 2004). Hansen (1999, 2011), for example, studied vocational education in the United States and Germany. In both countries, vocational programs were established in the 19th century. Germany, however, was more successful in sustaining and expanding these programs because of collective action between employers, trade unions and the government. In the United States, vocational programs were marginalized as subordinate to the academic educational system that was already in place.

Although empirical research is increasingly addressing international differences in how education stratifies society by examining the system of tracking and the level of vocational orientation, studies have usually ignored the potential trade-off between two stratifying outcomes: inequality in educational achievement and attainment on the one hand and preparing youth for employment on the other. In our view, it is essential to study both types of outcomes simultaneously because differentiation in educational systems was both meant to equip students with skills that would prepare them for technological changes in the labor market and to emphasize social class distances. The trade-off that was prominent in the political and societal discourse during the formation of the educational systems can still be seen today.

2.3 The trade-off between labor market allocation and equality of educational opportunity

Education has several "functions" in contemporary societies (Fend 1974): it is expected to maximize the capabilities of children, prepare students for active citizenship, allocate students to the labor market, and offer equal opportunities for all citizens. The extent to which an educational system is functioning well can be assessed by the attainment of those outcomes. Within a given educational institutional structure, however, some of these outcomes may be more easily achieved than others. This observation implies that in the design of educational systems, governments face policy trade-offs when a particular institution serves one function but detracts from another (Van de Werfhorst and Mijs 2010). Differentiation in educational systems, both in the form of tracking and vocational education, is argued to illustrate such a trade-off between two central functions of education: labor market allocation and the equality of educational opportunity (Shavit and Müller 2000). While differentiation eases the school-to-work transition, it also reduces the equality of educational opportunity between social groups.

This trade-off is clearly rooted in the two perspectives of the origins of differentiation in educational systems. On the one hand, tracked educational systems and a strong emphasis on vocational education are argued to enhance the allocation of students to the labor market (Shavit and Müller 1998), which is evidently linked to the technical-functional view of differentiation in educational systems as an outcome of changing labor market demands. On the other hand, it is argued that differentiation in educational systems reproduces social inequalities (Oakes 1985; Hallinan 1988; Brunello and Checchi 2007), a finding related to the literature that states that differentiation in educational systems is meant to preserve social distance between classes. Thus, even

though equality and labor market allocation may be seen as policy trade-offs, a true trade-off may not arise because a better allocation in the labor market was, according to some scholars, intentionally combined with an *in*equality of opportunity. If labor market allocation and inequality of opportunity are both explicit goals of education and educational systems, then it is questionable whether a trade-off exists at all.

For now, we assume that policy-makers are interested in increasing the inequality of educational opportunity and easing the labor market allocation of students. Numerous dependent variables have been studied in relation to both outcomes; however, they are often studied separately and by using various indicators for tracking and vocational orientation. We focus on both sides of the trade-off simultaneously, study several outcome variables that are known to be affected by educational systems, and use uniform measures of tracking and vocational orientation for all models.

2.3.1 Labor market allocation

Many researchers point to the importance of tracking and vocational orientation for the allocation of school-leavers to the labor market. In their influential cross national study on the school-to-work transition, Shavit and Müller (1998) find that secondary vocational educational degrees reduce the odds of unemployment. Vocational education functions as a safety net (Arum and Shavit 1995) and performs this function especially well in more vocationally oriented educational systems. In educational systems with a strong focus on specific skills (such as in dual systems with a combined trajectory of schooling and apprenticeships), youth unemployment tends to be lower compared to educational systems that offer more generic skills (Arum and Shavit 1995; Müller and Gangl 2003; Breen 2005; Müller 2005; Schrerer 2005; Ianelli and Raffe 2007). From a theoretical point of view, this trend is usually explained by the acquired skills and clear "signaling" of educational qualifications, which enhance individuals' access to the labor market (Van de Werfhorst 2011b). Based on these earlier studies, our expectation is that in more vocationally oriented educational systems, there is a lower level of youth unemployment compared to educational systems that offer more general skills (*hypothesis 1*).

Other studies find comparable results with different dependent variables. Wolbers (2007) focuses on the length of the job search and finds that in countries with a strong emphasis on vocational education, the transition from school into a first significant job takes less time. In strongly vocationally oriented educational systems, students acquire occupation-specific skills, which accelerate the allocation of students to the labor market. Our second hypothesis is therefore that the transition from school to work takes less time when countries provide their students with more vocational skills (*hypothesis 2*).

Allmendinger (1989) points to another outcome of differentiation in educational systems: in more tracked educational systems, the link between educational attainment and occupational status is stronger. Different tracks prepare students for specific roles in the occupational structure, which increases the strength of the link (Kerckhoff 2001; Schrerer 2005; Andersen and Van de Werfhorst 2010). In general, we expect the effect of education on occupational status to be stronger in more tracked educational systems (*hypothesis 3*).

The number of job shifts also relates to the tight link between education and occupation. Because of the strong connection between the educational system and the

occupational structure in more tracked educational systems, the frequency of job shifts is expected to be lower (Maurice, Sellier and Silvestre 1986; Allmendinger 1989: 239). When individuals are already sorted via the educational system, the fit with the first job will be better. Our fourth hypothesis is therefore that in more tracked educational systems, the average length one spends in a job will be longer (*hypothesis 4*).

2.3.2 Inequality of educational opportunity

An important criterion by which the functioning of educational systems may be assessed is whether students have equal opportunities. According to the meritocratic ideal, education sorts individuals according to their abilities, irrespective of their social background. A significant strand of literature refutes this idea and argues that the main function of education is the reproduction of social class differences (Bowles and Gintis 1976; Bourdieu and Passeron 1977; Collins 1979). Several authors argue that differentiation in educational systems originated to preserve social class differences (Marshall 1950; Kelly and Price 2011).

Drawing on these theories, it is maintained that the inequality of educational opportunity is stronger in tracked educational systems (Hallinan 1988; Ayalon and Gamoran 2000; Van de Werfhorst and Mijs 2010). An important explanation for this finding is that the influence of social origin is stronger at a younger age (Shavit and Blossfeld 1993). When students are sorted between different tracks at a young age, their social background plays a more prominent role in making the decision for a specific school type (Boudon 1974; Horn 2009). Another argument is that social inequalities are magnified in tracked educational systems because school facilities such as books and computers are often of better quality in the higher tracks (Brunello and Checchi 2007).

A first outcome that is often studied in this respect is student performance. In countries where secondary education is highly tracked, the effect of social origin on student achievement is stronger (Brunello and Checchi 2007; Schuetz, Ursprung, and Woessmann 2008). In more strongly tracked educational systems, there is a clear distinction between higher and lower tracks; when students are sorted in different tracks at a younger age, social class is expected to be of greater significance. Moreover, students conform to the expectations of the track they are placed in, leading to a self-fulfilling prophecy in relation to tracking institutions (Buchmann and Park 2009). Finally, studies show that students in higher level tracks are more motivated and involved in their studies than their counterparts in lower level tracks (Van Houtte and Stevens 2009). Our expectation is thus that the effect of social origin on student performance is stronger in more tracked educational systems (*hypothesis 5*).

Finally, we expect that the effect of social origin on the level of educational attainment is stronger when educational systems are more tracked. The difference in educational attainment between students of higher and lower social origins are expected to be magnified because tracking limits access to tertiary education for those enrolled in the pre-vocational tracks. Thus, in addition to educational achievement, educational attainment is assumed to be more strongly affected by social background in more strongly tracked educational systems (*hypothesis 6*).

2.4 METHODS

The proposed hypotheses are tested using linear regressions at the country level. All of the data we collected are at the country level, allowing us to analyze a large number of countries. With micro-level data, the analysis of a large of number countries would be difficult, and for some dependent variables we use (length of job search, job tenure), nearly impossible.

The method we use raises two problems. First, due to the nature of the method, we are unable to make causal claims. Although we theoretically expect educational systems to influence the labor market allocation of students and the equality of educational opportunity, and we can test those causal hypotheses, we cannot rule out reverse causality. Reverse causality could manifest when the design of educational systems depends on the extent to which an educational system functions well with respect to inequality or labor market allocation. However, such reversed causality patterns would plausibly lead to reverse correlations from those we expect. For instance, a *poor* labor market performance may induce policy-makers and schools to increase the vocational orientation of their system, or a high level of inequality could be associated with *lower* levels of tracking if policy-makers were responsive to the factual outcomes.

Second, most of the theories we describe are derived from studies that use individual-level data, while our analysis remains at the country level. A potential problem here is the ecological fallacy; drawing conclusions at the individual level by only using country-level data or, conversely, by testing micro-mechanisms with macro-level data. We avoid such problems by concentrating on macro-level outcomes in relation to macro-level institutions and by carefully measuring macro-level outcomes on the basis of appropriate micro-level data where possible. Furthermore, most of our hypotheses are supported by studies that utilized micro-level data.

2.5 DATA

We measure the dimensions of educational systems by performing principal factor analysis over several indicators. Thus, a country's score for a given dimension is based on its position relative to all other countries in the sample. It is therefore crucial to maximize the number of countries, which we did by merging several official statistics. In Table 2.1, the data are only shown for the 29 countries that have no missing values on any of our measures of educational systems. While our analyses are based on these 29 countries, the educational system indicators have been prepared for additional countries. The scores for these countries and further information about the data can be found in Appendix A.

2.5.1 Tracking

The level of tracking is constructed by performing a principal factor analysis on three country-level variables: (1) the age of first selection into a track, (2) the percentage of the total curriculum that is tracked, and (3) the number of tracks that are available for 15-year-olds.

The age of selection indicates when the actual differentiation starts. It is often used

as the only indicator of tracking (e.g., Hanushek and Woessmann 2006). The data for this indicator are primarily provided by the OECD (2005a, 2006b). The second indicator expresses the tracked curriculum as a percentage of the total curriculum in primary and secondary tracks. It indicates the length of the tracked curriculum and the proportion of primary and secondary education that take place in tracked form. The data for this indicator are derived from Brunello and Checchi (2007). The final indicator we use is the number of distinct school types that are available for 15-year-old students. Because differentiation primarily takes place in secondary education, the number of tracks that are available for 15-year-olds indicates tracking better than at any other age. This indicator is substantially different from the other two: the age of selection shows when differentiation starts, and the length of the tracked curriculum indicates what share is tracked, but the number of tracks available for 15-year-olds reveals how much differentiation there is. The data for the number of tracks are provided by the OECD (2005a, 2006b).

All three indicators emphasize different aspects of tracking that are relevant; thus, it is logical to use all three for the construction of our tracking indicator. A principal factor analysis[4] was performed on the three indicators, and the factor loadings were saved as regression coefficients. By using this technique, all countries received a relative score on the index of tracking (the index has a mean of 0 and a standard deviation of 1). This indicator can be found in Table 2.1.

2.5.2 Vocational orientation

Many educational systems provide vocational programs in several broad fields, while other educational systems provide students with job-specific skills by offering a dual system in which institutionalized education and employment in firms are combined. Both are categorized as vocational education; however, the skills that are provided in the dual system are more specific than those in broad vocational programs. Moreover, the dual system is said to be particularly relevant in providing students with specific work-related skills (Breen 2005). Systems that are highly vocational provide students with more specific skills, while less vocational systems produce students with more general skills.

Educational systems thus differ in the extent and the form of their vocational training programs and whether or not they offer a dual system (Shavit and Müller 1998; Müller and Gangl 2003). For this reason, vocational orientation is operationalized in two variables: the prevalence of vocational enrolment and the specificity of the vocational education. This less-parsimonious way of operationalizing the vocational orientation of educational systems is based on earlier findings (e.g., Breen 2005) that point to the importance of the dual system (and thus the specificity of skills) for the labor market allocation.The prevalence of vocational enrolment indicates the percentage of students who are enrolled in upper secondary vocational programs. Our focus is on upper secondary education because most vocational education takes place here. In addition, students tend to participate in upper secondary vocational programs before entering the labor market. The enrollment in upper secondary vocational education reveals something about the importance of vocational programs in the educational system, but reveals nothing about the specificity of the skills that are taught in these programs

4. The eigenvalue of the underlying factor that we obtained through principal factor analysis on the three indicators was 1.76.

TABLE 2.1: INDICATORS OF EDUCATIONAL SYSTEMS

Country	Index of tracking	Index of vocational enrolment	Vocational specificity (dual system)
Austria	1.75	1.70	32.70
Belgium	1.04	0.95	3.30
Canada	-1.31	-1.72	0.00
Chile	0.23	-0.16	0.00
Czech Republic	1.67	1.74	35.50
Denmark	-0.93	0.45	47.70
Finland	-0.93	0.74	10.50
France	-0.48	0.39	11.30
Germany	1.79	0.89	45.00
Greece	-0.48	-0.31	5.10
Hungary	1.30	-0.70	13.20
Iceland	-0.88	-0.14	16.40
Ireland	-0.13	-0.35	3.80
Israel	-0.13	-0.27	4.10
Italy	0.18	0.95	0.00
Japan	-0.48	-0.73	0.00
Korea	0.10	-0.55	0.00
Luxembourg	0.76	0.99	13.60
Netherlands	0.97	1.26	20.00
Norway	-1.08	0.89	13.30
Poland	-0.04	0.30	6.50
Slovakia	1.06	1.49	31.70
Slovenia	0.76	1.06	3.70
Spain	-0.80	0.00	2.80
Sweden	-1.06	0.69	0.00
Switzerland	-0.02	1.08	58.30
Turkey	1.11	-0.14	7.40
United Kingdom	-1.08	0.47	0.00
United States	-1.31	-1.84	0.00

(this topic is addressed by the next measure). The data regarding upper secondary education enrollment are collected by the OECD (2006a) and UNESCO. To reduce measurement error, we used both indicators and performed a principal factor analysis[5] to generate a new index of the prevalence of vocational enrolment. This index has a mean of 0 and a standard deviation of 1.

Although enrollment is a good indicator of the importance of vocational tracks, it reveals relatively little about the specificity of skills taught in these programs. Especially when vocational education takes place in a dual form (school-based and work-based), specific skills are imparted. Students who participate in a dual system work and study at the same time based on the idea that important skills are best learned on the job. Because the students immediately put their learned skills into practice, these skills are highly job specific. The strength of the dual system, and thus the specificity of

5. The eigenvalue of the underlying factor we obtained by performing principal factor analysis on the two indicators was 1.87.

skills, is measured by a single indicator: the percentage of upper secondary vocational education that takes place in dual systems (OECD 2007a). Both indicators can be found in Table 2.1.

2.5.3 The statistical association between the three indicators

Although the indicators of vocational orientation and tracking are presented separately, they are correlated with one another. When there are only a few educational tracks for all students, it is unlikely that the focus of those tracks is vocational and even less likely that teaching is structured in a dual system. Some level of tracking therefore appears to be a precondition for any vocational programs. In the same line of reasoning, if there is no vocational education at all, a dual system is absent as well.[6]

However, we follow the stratification literature in examining tracking and vocational orientation separately (Brunello and Checchi 2007; Bol and Van de Werfhorst 2011a). Moreover, in educational systems with little tracking, there are vocational programs—for example, in Norway (see Figure 2.1). Similarly, in strongly tracked educational systems, it is possible that the vocational orientation is limited (for example Turkey). In Figure 2.1, the scatter plots for all three indicators are shown. Although the figure demonstrates a clear relationship between the index of tracking and the index of vocational enrollment, the correlation is far from perfect. In a similar fashion, the indicator for vocational specificity (dual system participation) is related—although far from perfect—to the index of vocational enrollment. Statistically, it seems useful to separate these dimensions, as the pair-wise correlations are not extremely high: tracking correlates with vocational enrollment and vocational specificity with $r = 0.48$ and 0.40, respectively. The two indicators of vocational orientation have a correlation of 0.54.

2.5.4 Dependent variables

The dependent variable we use to test our first hypothesis is youth unemployment as a ratio of adult unemployment. This variable, which Breen (2005) also used, has the advantage of indicating the extent to which young labor market entrants differ from the general labor market in finding a job instead of general unemployment patterns. The youth unemployment ratio is derived from the UNESCO database for 2002.

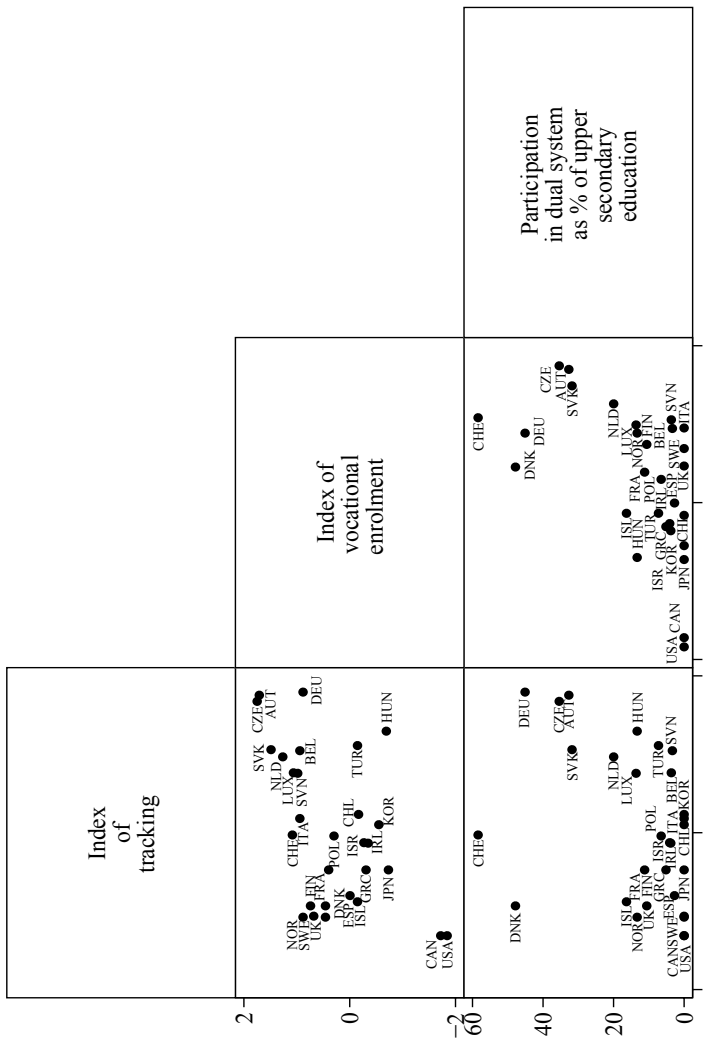
Our second hypothesis is tested by using the average length of job search as a dependent variable. We expect that students are allocated to the labor market faster when they have more specific skills. The measure of average duration of the school-to-work transition that we use is from the Employment Outlook of 2008 (OECD 2008b: 72), which measures the length in years before school-leavers find their first career job.

A third dependent variable that we use to test the labor market allocation function of tracked educational systems is the strength of the relationship between education and labor market position. We operationalized this factor by taking the strength of the effect of years of education on occupational status. When the link between education and occupation is indeed stronger in more tracked educational systems (hypothesis 3), we expect this effect to be stronger. The strength of the effect of years of education on occupational status is estimated by using data from the International Social Survey Programme[7] (ISSP) of 2008. Occupational status is measured by using the

6. It should be noted that the OECD (2005b, 2006a) created one index of tracking that combines tracking institutions with vocational enrolments.

7. The ISSP is an annual cross-national survey. Each participating country draws a representative sample

FIGURE 2.1: THE THREE INDICATORS



International Socio Economic Index (ISEI) by Ganzeboom, De Graaf, and Treiman (1992). For each country, we regressed occupational status on years of education.[8] We ran these regressions only for men between 25 and 40 years of age to ensure that country variations in gender effects or cohort differences do not appear in the effect sizes. We saved the b-coefficients of the effect of years of education on ISEI and used these results in the country-level regressions. However, because the standard error of these b-coefficients (and hence the confidence interval of the effects) differs across countries, we use sampling weights. In the country regressions, this dependent variable is weighted for the inverse of the standard error of the effect so that the observations for those countries where the point estimation of the effect has a larger confidence interval are less important.[9]

The fourth hypothesis is tested by taking the average time that individuals spent in the same job between the ages of 15 and 24. The allocation of school-leavers is expected to be more successful in tracked and vocationally oriented educational systems. As a consequence, the school-leavers are expected to spend more time in the same occupation. We measured this relationship by taking the average job tenure of individuals between the ages of 15 and 24 for the year 2006 as reported by the OECD in its online database.[10] This measure may be affected by the average age of entering the labor force in a country, which may be lower in countries with a tracked educational system.

Hypothesis 5 is investigated by using data from the Program for International Student Assessment (PISA) of 2009,[11] a cross-national survey from the OECD that tests the cognitive performance of 15-year-old students. As a measure, we take the difference in reading test scores[12] between children from a low social background and a high social background. This indicator takes the difference between the average performance on the reading test of children who grew up in a high social class environment (top decile) and the average performance on the science tests of children who grew up in a low social class environment (bottom decile). Our expectation is that the inequality of educational opportunity, and thus the difference between the average performances, is greater in more tracked educational systems.

For our final hypothesis, we take the effect of social origin on the level of educational attainment. To measure this relationship, we use data from the European

from their population (the sample size per country is approximately 1,500). More information can be found on www.issp.org, last accessed January 3, 2012.

8. Years of education is the most appropriate measure, as it is measured in a comparable way across countries. This is not the case for the highest level of educational attainment. All regressions were run for a sample between 24 and 65 years of age.

9. Our results are largely supported when we do not use sampling weights. However, for a correct estimation of the country-level regression, it is important to take the uncertainty of the effect size at the individual level into account.

10. The database can be found on stats.oecd.org, last accessed January 3, 2012).

11. The PISA study of 2009 drew a random sample at both the school and individual level in 65 countries. The 15-year-old students were tested on three domains: reading, science and mathematics. In addition, students were surveyed on a broad selection of background variables. More information on the PISA study can be found at www.pisa.oecd.org, last accessed January 3, 2012).

12. We use reading because it was the major domain of the PISA 2009 study and was therefore more extensively tested than science or mathematics. If we had used a combined scale of all three domains, the results would have been identical.

Social Survey[13] (ESS) of 2008 where we regressed years of education on the father's level of education when the respondent was 14 years of age. Again, we restricted the sample to men between 25 and 40 years of age. The father's education is measured in five categories,[14] and because we are interested in the effect size, we summarized the dummy variables in one single effect size by using the sheaf coefficient[15] (Heise 1972). This method yields one effect size (instead of a separate coefficient for each dummy) for father's education on the years of educational attainment per country. For this dependent variable, we use the same weighting procedure as for hypothesis 3 by using sampling weights for the standard errors. All dependent variables can be found in Table 2.2, and the standard errors that were used as sampling weights for hypothesis 3 and 6 can be found in Appendix B.

2.5.5 Control variables

Although our focus is on educational systems, there are several other explanations for cross-national variation among our six dependent variables. A first control variable is GDP per capita, measured in 2006 US dollars, which is derived from the World Bank online database.[16] However, the general wealth of a country does not necessarily reveal something about the investment in education. Therefore, a second control variable we add to all equations is the spending on education as a percentage of the total government expenditure (derived from the World Bank online database for the year 2006).

The first four hypotheses address the labor market, and thus we also control for cross-national differences in labor market processes. First, we add the Employment Protection Legislation index of 2008 (OECD 2008b). When employment protection is stricter, labor force entrants have greater difficulties in finding a job (Nickell 1997). We also control for the level of unemployment in a country, as it indicates the general state of the labor market (derived from the World Bank online database for the year 2007).

Finally, for the fifth and sixth hypothesis, we examine student performance and levels of educational attainment. It is known that students in public schools perform worse than students in private schools (Fuchs and Woessmann 2007). It could well be that a performance gap between lower- and higher-class students is explained by the composition of school types in a country. A final control variable is therefore the percentage of secondary schools that are public. This measure is taken from the

13. The European Social Survey is a bi-annual cross national survey in Europe. Each country draws a representative sample from their population, with average sample sizes of about 1,500. More information can be found on www.europeansocialsurvey.org, last accessed January 3, 2012.

14. These 5 categories are "less than lower secondary education (ISCED 0-1)," "lower secondary education completed (ISCED 2)," "upper secondary education completed (ISCED 3)," "post-secondary non-tertiary education completed (ISCED 4)," and "tertiary education completed (ISCED 5-6)."

15. The sheaf coefficient for regression $y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$, where y is years of education and the four X-es denote the dummy variables for father's education, is calculated according to the following formula: $b_{sheaf} = (b_1*X_1)+(b_2*X_2)+(b_3*X_3)+(b_4*X_4)$. The standardized effect of father's occupation on years of education is then calculated by taking the beta-coefficient of the sheaf variable for the regression equation $y=a + b_{sheaf}X_{sheaf} + e$. For more information on this procedure see Heise (1972).

16. The online database of the World Bank can be found at data.worldbank.org, last accessed January 3, 2012.

Table 2.2: Dependent variables

Country	Youth unemployment ratio	Length of job search (years)	Effect of years of education on ISEI	Average job tenure for 15-24 year olds (years)	Difference in reading score between low and high social class background	Effect of social origin on years of education
Austria	1.70	2.00	4.12	2.50	126.03	0.47
Belgium	2.60	2.90	3.93	1.90	139.28	0.39
Canada	2.10		3.11		88.17	
Chile	3.40		3.10		122.97	
Czech Republic	2.60	3.00	3.54	2.20	136.65	0.38
Denmark	1.80	2.80	1.93	1.50	120.75	0.31
Finland	2.60		2.73	1.10	70.50	0.33
France	2.60	2.80	2.04	1.70	149.49	0.52
Germany	1.20	1.50	3.28	2.30	153.13	0.37
Greece	3.30	4.40			105.14	0.29
Hungary	2.50	4.70		2.20	154.28	0.46
Iceland	2.90			1.70	70.17	
Ireland	2.20		2.63	2.10	111.95	0.35
Israel	2.40			2.40	118.37	0.37
Italy	3.70	3.40			103.85	0.51
Japan	2.10		2.49		89.89	
Korea			3.34		84.97	
Luxembourg	3.20	2.60		2.30	134.87	0.54
Netherlands	2.30	2.00	1.61	2.80	103.77	0.36
Norway	3.70		1.63	1.60	86.10	0.40
Poland	2.60	3.40	3.11	1.90	116.56	0.44
Slovakia	2.40	2.80	3.55		129.09	0.36
Slovenia	3.20		3.02		120.27	0.36
Spain	2.30	4.40	2.26	1.60	106.25	0.45
Sweden	3.00	2.80	3.06	1.30	113.85	0.31
Switzerland	2.30	2.00	2.70	2.20	113.26	0.39
Turkey	2.40		2.79		126.41	0.43
United Kingdom	2.80	2.60	3.41	2.00	111.49	0.27
United States	2.60		2.86		123.28	

interactive online database from PISA 2006.[17] All control variables can be found in Appendix C.

2.6 RESULTS

All of the effects of the indicators of the educational systems on our dependent variables are shown with and without controls. We will first discuss the indicators related to labor market allocation. Next, we will focus on the other side of the trade-off, the (in)equality of educational opportunity.

2.6.1 Labor market allocation

All of the results of the regressions are shown in Table 2.3. First, we analyze the youth/adult unemployment ratio as a dependent variable. In Model 1, we see that two dimensions of educational systems are significantly related to the youth unemployment ratio and that tracking has no effect on the youth/adult unemployment ratio. Surprisingly, the level of vocational enrolment is positively related to youth unemployment. However, this effect disappears when we add our control variables in Model 2. The negative effect of vocational specificity (dual system participation) is persistent in both models: countries that provide their students with more specific skills in the form of a dual system tend to have lower levels of youth unemployment. In line with Breen (2005), we find that not the sheer size of vocational enrolment but rather the strength of the dual system reduces youth unemployment. We therefore confirm our first hypothesis: in countries with a stronger emphasis on vocational education (in the form of a dual system) youth unemployment is lower. Of all control variables, only the employment protection index has a significantly positive effect on youth unemployment. This finding gives support to the idea that in countries with stricter employment protections, the labor market is less dynamic, and thus school-leavers have more difficulties in finding a job.

The second dependent variable we analyze is the duration of the school-to-work transition. In Model 3, we see that the length of the job search is significantly lower in countries with higher levels of vocational enrollment. When educational systems provide a large number of students with vocational skills, the average duration of the school-to-work transition is shorter. After controlling for wealth, government expenditures on education, employment protection and unemployment (Model 4), these results remain highly significant. Our second hypothesis is therefore confirmed, as well: in more vocationally oriented educational systems, the duration of the school-to-work transition tends to be shorter. Of all control variables, only wealth, measured in GDP per capita, has a significant effect: in richer countries, job-seekers require less time to enter their first career job.

The effect of years of education on occupational status (ISEI) is our third dependent variable. Our hypothesis was that tracked educational systems prepare students better for a specific place in the occupational structure. In Model 5, we see that our index of tracking is indeed positively associated with the dependent variable. Neither of the other variables seems to be related to the effect of years of education on occupational status. The positive effect of tracking is persistent in Model 6, where we add the

17. This database can be found at pisa2006.acer.edu.au/interactive.php, last accessed January 3, 2012.

Table 2.3: Regressions for the the dependent variables associated with labor market allocation

	Youth unemployment		Length of job search		Effect of years of education on ISEI		Average job tenure	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tracking	-0.171	-0.121	0.141	-0.048	0.393**	0.477**	0.317***	0.328***
	(0.106)	(0.139)	(0.173)	(0.219)	(0.153)	(0.204)	(0.080)	(0.105)
Vocational enrolment	0.354***	0.252	-0.910***	-0.708**	-0.036	0.137	-0.067	-0.125
	(0.125)	(0.146)	(0.272)	(0.283)	(0.174)	(0.152)	(0.132)	(0.139)
Vocational specificity (dual system)	-0.024***	-0.025***	-0.015	-0.011	-0.009	-0.014**	0.001	-0.001
	(0.006)	(0.007)	(0.009)	(0.011)	(0.006)	(0.007)	(0.005)	(0.005)
GDP per capita		-0.004		-0.024*		-0.002		-0.001
		(0.007)		(0.012)		(0.010)		(0.006)
Government educ. Spending		0.070		0.017		0.040		-0.045
		(0.050)		(0.127)		(0.051)		(0.054)
Employment protection		0.333*		0.505		-0.615***		-0.150
		(0.190)		(0.364)		(0.179)		(0.157)
% Unemployed		-0.050		-0.083		0.109		-0.095
		(0.060)		(0.100)		(0.062)		(0.058)
Constant	2.801***	1.708	3.843***	3.678	3.054***	3.283***	1.960***	3.527***
	(0.117)	(0.992)	(0.244)	(2.096)	(0.153)	(0.977)	(0.116)	(1.013)
R^2	0.44	0.56	0.63	0.76	0.28	0.58	0.55	0.72
N	28	27	17	17	23	22	19	19

NOTE. –Based on calculations with data from Tables 2.1, 2.2 and Appendix C. The results in the models without controls remain the same with a constant sample (equal sample to the models with controls). In Model 5 and 6 we performed weighted regressions, where the country specific effect size of years of education on ISEI (dependent variable) was weighted by the standard error in the country specific b-coefficient.

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

control variables. In this model, we also find some surprising effects of other variables. Dual system participation and the strictness of employment protection are negatively associated with our dependent variable. One explanation for the negative effect of the dual system indicator is that workers who graduated in a dual system are less likely to work in high status occupations than those with a more general education (Shavit and Müller 2000). Model 6 does, however, provide support for our third hypothesis, which states that in more tracked educational systems, education allocates students more directly to a place in the occupational structure.

The final dependent variable we use to test the labor market allocation function is the average job tenure of 15- to 24-year-olds. In Model 7, we find a positive and significant effect of the index of tracking. This effect persists after adding all control variables: in countries where educational systems are more strongly tracked, young employees spend more time in the same job. When students are sorted in different tracks, they are prepared for a more specific job in the occupational structure. Because of this strong match, their average job tenure is longer. Our fourth hypothesis is therefore confirmed. None of the control variables has a significant effect on the average job tenure.

To summarize, we have confirmed all four hypotheses related to labor market allocation. This result offers strong evidence for one side of the trade-off: both tracking and the vocational orientation of educational systems positively influence the labor market allocation of students. In tracked and vocationally oriented educational systems, there is a lower level of youth unemployment, it takes school-leavers less time to find a job, education prepares school-leavers for a specific place in the occupational structure, and the average job tenure is longer. The evidence is generally stronger for the positive effects of the vocational orientation than for tracking per se.

2.6.2 Inequality of educational opportunity

In Table 2.4, the results of the regressions with two dependent variables that signify the (in)equality of educational opportunity are shown. First, we use the difference in performance on the PISA 2009 reading test between children from a high social class background (top decile) versus children from a low social class background (bottom decile). In Model 1, we can see that tracking has a positive effect: in more tracked educational systems, the variation in student performance is more based on the students' social class background. After adding control variables for wealth, government spending on education, and the percentage of public schools, the effect is persistent, although the significance slightly decreases. Tracking enhances the importance of social origin for reading performance. Our fifth hypothesis is therefore confirmed. None of the control variables appear to be related to our dependent variable.

Our final dependent variable is the effect of social origin on the level of educational attainment. The results in Model 3 show that only tracking has a positive effect on this dependent variable. In countries with more tracked educational systems, the effect of social origin on years of education is stronger than in countries with less tracked educational systems. When we add our control variables that yield non-significant effects in Model 4, we see that this effect is persistent. Our sixth hypothesis is therefore confirmed as well.

While the results from Table 2.3 show that tracking and vocational educational programs have beneficial effects for labor market allocation, this finding is not true for

the equality of educational opportunity. In more tracked educational systems, social background is a stronger determinant for individuals' opportunities in school. The vocational orientation of educational systems is, however, much less important than the tracked nature of secondary education.

Table 2.4: Regressions for the the dependent variables associated with inequality of educational opportunity

	Difference in reading score between low and high social class background		Effect of social origin on years of education	
	(1)	(2)	(3)	(4)
Tracking	14.850***	12.306*	0.033**	0.059*
	(4.161)	(5.922)	(0.012)	(0.027)
Vocational enrolment	-4.383	-4.168	-0.004	-0.019
	(4.888)	(5.159)	(0.019)	(0.022)
Vocational specificity (dual system)	0.183	0.262	-0.001	-0.001
	(0.251)	(0.281)	(0.001)	(0.001)
GDP per capita		-0.022		0.001
		(0.207)		(0.001)
Government educ. spending		-1.698		0.003
		(1.758)		(0.012)
% Public schools		0.006		0.001
		(0.182)		(0.001)
Constant	11.988***	133.345***	0.385***	0.232
	(4.489)	(30.184)	(0.020)	(0.175)
R^2	0.40	0.49	0.19	0.39
N	29	25	23	19

NOTE. –Based on calculations with data from Tables 2.1, 2.2 and Appendix C. The results in the models without controls remain the same with a constant sample (equal sample to the models with controls). In Model 3 and 4 we performed weighted regressions, where the country specific standardized effect size of father's education on years of education (dependent variable) was weighted by the standard error in the country specific b-coefficient.

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

2.7 Conclusion

In this chapter, we performed a country-level analysis of the effects of tracking and vocational orientation on different outcomes. Our main focus was on the potential trade-off between labor market allocation and equality of educational opportunity: do systems that perform well in terms of young people's labor market preparation perform worse when in promoting equality of opportunity? Using newly developed indicators of the level of tracking and vocational orientation of educational systems, we found confirmation of the existence of such a trade-off. Differentiation in educational systems improves the allocation of school-leavers to the labor market but increases the inequality of educational opportunity.

We also argue that this trade-off has its roots in two different perspectives on the origin of differentiation in educational systems. A technical-functional explanation

for differentiation in educational systems is that it was a necessary reaction to rapid technological changes. The skill demands for many occupations changed, and to cope with this shift in demand, different tracks (both general and vocational) were established. A second perspective views differentiation in educational systems as a way to institutionalize social distances in the educational system. Differentiation was the elites' coping mechanism for the lower class children's increased access to education.

Our empirical results provide evidence for both perspectives. A strong reliance on vocational programs decreases the youth unemployment and the length of the job search. When students are equipped with vocational skills, they are more quickly allocated to the labor market. Tracking is positively related to the success of the job match: when students are already sorted in the educational system, they remain in an occupation for a longer time. The other side of the trade-off is that tracking reduces the equality of educational opportunity. In more tracked educational systems, students' test performance is determined by their social origin to a larger extent. The same pattern is found for the effect of social origin on occupational status, which is stronger in countries with more tracked educational systems.

Empirically, it seems that only tracking drives the inequality of educational opportunity: the level of vocational orientation is not associated with the two indicators that signify the effects of social origin on student performance and labor market success. However, in regard to labor market access, it is particularly the educational program's vocational orientation that is important. Tracking institutions (age of first selection, number of tracks available to 15-year olds) distinguish educational systems mainly in the early stages of secondary education, whereas the vocational orientation of educational systems primarily refers to variations between countries in the advanced stages of secondary (and tertiary) education. Therefore, our findings illustrate that the trade-off would potentially become less prominent, allowing for a combined focus on good labor market allocation and reduced inequalities, if tracking at the earlier stages of secondary education were limited. In contrast, a strong vocational orientation, including a dual system with the strong involvement of employers, would become more prominent in educational systems. Given that our findings persisted after we included various relevant control variables that are known to affect inequalities and labor market allocation, such a conclusion is defensible from a policy perspective.

However, whether such an interpretation of our findings can lead to changes of policy depends on whether political and social elites are able and willing to see promoting equality and labor market preparation as two equally important goals of education. If, however, it is true that tracked educational systems are *meant* to emphasize distance between social groups, as Marshall (1950) and later scholars have argued (e.g., Benavot 1983; Lucas 1999), such a policy implementation may be unlikely, irrespective of our findings.