Educational Systems and the Trade-Off between Labor Market Allocation and Equality of Educational Opportunity

THIJS BOL AND HERMAN G. VAN DE WERFHORST

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 inequality of educational opportunity. This presumed trade-off between equality and labor market preparation is clearly rooted in two different perspectives on the origin of differentiation in educational systems, dating back to the nineteenth 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 between labor market allocation and equality of opportunity.

In the past decade, there have been several cross-national studies of the payoffs to education in the labor market (Breen and Buchmann 2002; Müller and Gangl 2003; Müller 2005), as well as the effects of social origin on educational outcomes (Hanushek and Woessmann 2006; Jenkins et al. 2008). In trying to explain differences in educational payoff, scholars have increasingly acknowledged the importance of cross-national variation in educational systems themselves.[1] In this literature, educational systems are therefore being compared both in terms of their placement of students in different educational tracks,[2] and in terms of the extent to which educational systems provide their students with vocational skills (see Kerckhoff 2001).

Earlier versions of this article have been presented at the 2010 World Conference of Comparative Education Societies in Istanbul and at the 2012 Onderwijs Research Dagen conference in Wageningen. This research is supported by VIDI grant no. 452-07-002 from the Netherlands' Organization for Scientific Research, and by the Programme Council for Education Research of the Netherlands' Organization for Scientific Research grant no. 411-10-920.

[1] See, e.g., Maurice et al. (1986); Allmendinger (1989); Kerckhoff (1995); Shavit and Müller (1998); Müller and Gangl (2003); Shavit et al. (2007); Pfeffer (2008); Horn (2009); Bol and Van de Werfhorst (2011).

[2] In defining "educational track," 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 [1997] 2006, 12).

Received June 21, 2011; revised February 19, 2012; accepted April 2, 2012; electronically published February 5, 2013

Comparative Education Review, vol. 57, no. 2.

0010-4086/2013/5702-0006$10.00

The first dimension, tracking, refers to the existence of different educational programs at the same time point in an educational trajectory.[3] These programs are hierarchically ranked, and it is clear which one is the "higher" and which the "lower" (Allmendinger 1989). Tracking predominantly takes place in secondary education, although curriculum tracking exists in postsecondary education as well. The second dimension on which educational systems differ is their level of vocational orientation: the extent to which education provides students with vocational skills, and the specificity of these skills. Education may supply students with general and specific skills, and the balance between these two differs across educational systems. The specificity of skills in education is mainly associated with upper secondary vocational education: educational programs where the emphasis lies on learning (work-)specific skills, often in forms in which employers influence the curriculum. Our main research question is how these two dimensions are related to two central education-linked stratification outcomes: the allocation of students to the labor market and the equality of educational opportunity.

In this article, our contribution to the current literature is twofold. First, we propose new measures for tracking and vocational orientation. Although many scholars recognize the importance of these two dimensions of educational systems, little effort has been made to use comparable measures across various studies. For each study, new indicators are used, sometimes developed for the specific study, sometimes based on already existing indicators provided by statistical agencies. These classifications are often poorly documented, so researchers cannot replicate the findings or use the same classifications in other research. With the increased availability of data of educational systems such as those provided by the Organization for Economic Cooperation and Development (OECD), Eurydice, and the United Nations Educational, Scientific, and Cultural Organization (UNESCO), we believe it is now possible to rank countries on the two dimensions of educational systems (tracking and vocational orientation) and make our classifications available to other researchers.

Our second contribution is to 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, are known to smooth the school-to-work transition (Shavit and Müller 2000), there are several studies that point to more controversial outcomes of highly differentiated educational systems. In more tracked educational systems, the effect

[3] 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, and for the duration of multiple years.

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 on either labor market allocation or the (in)equality of educational opportunity, we focus on both at the same time. 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 by showing that educational systems that are more tracked or vocationally oriented both enhance the allocation of students in 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 argued to be 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.

This article proceeds as follows. First, we discuss the origins of differentiation in educational systems and relate these to the trade-off between labor market allocation and equality of educational opportunity. Next, we formulate hypotheses on the relation between educational systems and indicators that measure both sides of the trade-off. In the third and fourth sections, we discuss our method and data. After discussing our findings in the fifth section, we conclude.

Differentiation in Educational Systems: A Brief History

While the cross-national differences in educational systems are the focus of many studies, relatively little attention has been given to the question of how these educational systems came into existence. Before we propose hypotheses on the potential existence of a trade-off between labor market allocation and equality of educational opportunity, we are interested in the historical development of the two studied dimensions, vocational orientation and tracking. Our interest concerning an imbalance between the goals of equality and of efficient allocation to the labor market can be placed in the context of how these institutions have developed in the past one-and-a-half centuries.[4] Differentiation in educational systems, in the form of both separate educational tracks and vocational education, coincided with educational expansion in the nineteenth century (Archer 1979, 144). During this period,

[4] 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 nineteenth century, it is now almost completely abolished. Recent studies show that as a consequence of ongoing educational expansion, there is some differentiation in higher education as well (Shavit et al. 2007). However, differentiation remains most important in secondary education.

secondary education transformed from being an institution for the elite to an institution for the masses (Boli et al. 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 increased as well. Already in the nineteenth century, students from several European countries were separated in different types of education. In his study on vocational education, Aaron Benavot (1983, 64–65) notes that in the early twentieth century, most European educational systems had developed 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." Historically, educational systems became more differentiated in the late nineteenth century, but why did this transformation take place? Sean Kelly and Heather Price (2011) argue that the implementation of tracking in educational systems can be explained by both technical-functional arguments as well as social stratification theories, which argue that differentiation is intended to stress social class differences.

The first, and dominant, technical-functional explanation is that 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, in the functionalist reasoning, educational expansion is argued to be a consequence of the Industrial Revolution (Davis and Moore 1945; Bell 1973). Differentiation between technical and general tracks was functional, as a growing number of occupations demanded complex skills. Skill specialization, in the crudest way 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 affected skill demands on 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 social distances between social classes.[5] With educational expansion, the clear distinction between the educated elite and noneducated lower classes slowly disappeared, and thus separated tracks were set up to emphasize differences. Thomas H. Marshall (1950, 112) 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." While

[5] See Marshall (1950); Bowles and Gintis (1976); Collins (1979); Lucas (1999).

differentiation in educational systems might be legitimated by technological change, the underlying motives are argued to be 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 and perpetuates differences between social classes.

Although in the late nineteenth century all Western societies implemented some form of differentiation, by now there is strong cross-national variation in the level of tracking and the level of vocational orientation. This variation in educational systems is argued to be caused by country-specific negotiations between supply- and demand-side actors (Thelen 2004). Hal Hansen (1999), for example, studied (vocational) education in the United States and Germany. In both countries, vocational programs were established in the nineteenth century. Germany, however, was more successful in sustaining and expanding these programs because of collective action between employers, trade unions, and the government. In contrast, vocational programs in the United States were marginalized, as they were subordinated to the academic educational system that was already in place.

Although empirical research is increasingly addressing international differences in how education contributes to social stratification by looking at the system of tracking and the level of vocational orientation, studies usually have 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 meant both to equip students with skills that prepared them for technological changes in the labor and to emphasize social class distances. The trade-off has been prominent in the political and societal discourse during the formation of the educational systems we still see today.

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 on the basis of examining whether these four outcomes are achieved. Within a given educational institutional structure, however, some of these outcomes may be more easily achieved than others. This implies that, in the design of educational systems, governments have to face policy trade-offs when a particular institution serves one function but harms another (Van de Werfhorst and Mijs 2010). Differentiation in educational systems, in the form of both 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 smooths 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 on the origin of differentiation in educational systems. On the one hand, tracked educational systems and a strong emphasis on vocational education are argued to enhance the efficient allocation of students to the labor market (Shavit and Müller 1998), which is evidently linked to the technical-functional view on 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), which is strongly related to the literature that argues 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, as a better allocation in the labor market was, according to some scholars, intentionally combined with inequality of opportunity. While a great variety of dependent variables have been studied in relation to both outcomes, they are often studied separately and by using many different 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.

Labor Market Allocation

Many studies point to the importance of tracking and vocational orientation for the allocation of school-leavers in the labor market. In their influential cross-national study on the school-to-work transition, Yossi Shavit and Walter Müller (1998) find that secondary vocational educational degrees reduce the odds of unemployment. Vocational education functions as a safety net (Shavit and Müller 2000) 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 of a combined trajectory of schooling and apprenticeships), youth unemployment tends to be lower compared to educational systems that offer more generic skills.[6] From a theoretical point of view, this is usually explained by the acquired skills and clear "signaling" of educational qualifications that enhance access to the labor market (Van de Werfhorst 2011). Based on these earlier studies, our expectation is that in more vocationally oriented educational systems

[6] See Arum and Shavit (1995); Müller and Gangl (2003); Breen (2005); Müller (2005); Scherer (2005); Ianelli and Raffe (2007).

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. Focusing on the length of a job search, Maarten Wolbers (2007) finds that in countries with a strong emphasis on vocational education, the transition from school into a first significant job takes relatively 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 the more countries provide their students with vocational skills (hypothesis 2).

Jutta 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 places in the occupational structure, which increases the strength of the link (Kerckhoff 2001; Scherer 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).

Related to the tight link between education and occupation is the amount of job shifts. Because of the strong connection between the educational system and the occupational structure in more tracked educational systems, the frequency of job shifts can be expected to be lower (Maurice et al. 1986; Allmendinger 1989, 239). When individuals are already sorted in the educational system, the fit with the first job will be better. Our fourth hypothesis therefore reads that in more tracked educational systems, the average length one spends in a job will be longer (hypothesis 4).

Inequality of Educational Opportunity

An important aspect on which the functioning of educational systems can be assessed is if students have equal opportunities. According to the meritocratic ideal, educational systems sort individuals according to their abilities—irrespective of social background. A large 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), just as several authors argue that differentiation in educational systems originated in order to maintain social class differences (Marshall 1950; Kelly and Price 2011).

Drawing on these theories, we maintain 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 in dif-

ferent tracks at a young age, 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 are often better for students 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 et al. 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 therefore expected to be of greater significance. On top of this, students live up to the expectation of the track they are 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 study 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).

Strongly related to this is our final expectation: the effect of social origin on the level of the educational attainment is stronger when educational systems are more tracked. The difference in educational attainment between students of higher and lower social origins is magnified in more strongly tracked educational systems, it can be expected, because tracking limits access to tertiary education for those enrolled in the (pre-)vocational tracks. So, in addition to educational achievement, educational attainment can be assumed to be more strongly affected by social background in more strongly tracked educational systems as well (hypothesis 6).

Method

The proposed hypotheses are tested by using linear regressions at the country level. All the data we collected are on the country level, allowing us to analyze a high number of countries. With micro-level data, the analysis of a large of number countries would be hard, and, for some dependent variables we use (length of job search, job tenure), almost 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 reversed causality. Reversed causality could be the case when the design of educational systems was dependent on the extent to which an educational system is functioning well with regard to inequality or labor market allocation. However, such reversed causality patterns would plausibly be leading to reversed correlations to the ones 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 would be 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, testing micro mechanisms by using macro 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 adequate micro-level data where possible. Furthermore, most of our hypotheses are supported by studies that used micro-level data.

Data

We measure the dimensions of educational systems by performing principal factor analysis over several indicators. This means that the score of each country on a 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 aimed to do by merging several official statistics, which are described below. In table 1, the data are shown only for the 29 countries that have no missing values on either of our measures of educational systems. There are, however, more countries for which the indicators of educational systems are prepared. The scores for these countries, as well as more information on the data, can be found in tables A1 and A2 in the online version of *Comparative Education Review*.

Tracking

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

Age of selection indicates when the actual differentiation starts and is often used as the only indicator of tracking (e.g., Hanushek and Woessmann 2006). Data for this indicator are mainly provided by the OECD (2005b, 2006b). The second indicator expresses the tracked curriculum as a percentage of the total curriculum in primary and secondary tracks. It basically indicates the length of the tracked curriculum and shows the share of primary and secondary education that takes place in tracked form. The data for this indicator are gathered for the year 2002 and are derived from Giorgio Brunello and Daniele Checchi (2007). The final indicator we use is the number of distinct school types that are available for 15-year-old students. Because differentiation takes place mainly in secondary education, the number of

TABLE 1
INDICATORS FOR EDUCATIONAL SYSTEMS

Country	Index of Tracking	Index of Vocational Enrollment	Vocational Specificity (Dual System)
Austria	1.75	1.70	32.70
Belgium	1.04	.95	3.30
Canada	−1.31	−1.72	.00
Chile	.23	−.16	.00
Czech Republic	1.67	1.74	35.50
Denmark	−.93	.45	47.70
Finland	−.93	.74	10.50
France	−.48	.39	11.30
Germany	1.79	.89	45.00
Greece	−.48	−.31	5.10
Hungary	1.30	−.70	13.20
Iceland	−.88	−.14	16.40
Ireland	−.13	−.35	3.80
Israel	−.13	−.27	4.10
Italy	.18	.95	.00
Japan	−.48	−.73	.00
Korea	.10	−.55	.00
Luxembourg	.76	.99	13.60
Netherlands	.97	1.26	20.00
Norway	−1.08	.89	13.30
Poland	−.04	.30	6.50
Slovakia	1.06	1.49	31.70
Slovenia	.76	1.06	3.70
Spain	−.80	.00	2.80
Sweden	−1.06	.69	.00
Switzerland	−.02	1.08	58.30
Turkey	1.11	−.14	7.40
United Kingdom	−1.08	.47	.00
United States	−1.31	−1.84	.00

NOTE.—Sources can be found in tables A1 and A2 (available online).

tracks that are available for 15-year-olds indicates tracking better than any other age. This indicator is substantially different from the other two: age of selection shows when differentiation starts, the length of the tracked curriculum indicates what share is tracked, but the number of tracks available for 15-year-olds shows how much differentiation there is. Data for the final indicator are provided by the OECD (2005b, 2006b).

All three indicators emphasize different aspects of tracking that are relevant, and it thus makes sense to use all three of them for the construction of our indicator of tracking. On the three indicators, a principal factor analysis was performed,[7] and the factor loadings were saved as regression coefficients. By using this technique, all countries got a relative score on the index of tracking (the index has a mean of 0 and a standard deviation of 1). The indicator can be found in table 1.

[7] The eigenvalue of the underlying factor we obtained by performing principal factor analysis on the three indicators was 1.76.

Vocational Orientation

Many educational systems provide vocational programs in a few broad fields, while other educational systems provide students with job-specific skills by offering a dual system in which institutionalized education and working in firms are combined. Both are categorized as vocational education even though the skills that are provided in the dual system are more specific than those in broad vocational programs. On top of that, the dual system is said to be particularly relevant to provide students with specific work-relevant skills (Breen 2005). Systems that are highly vocational provide students with specific skills, while less vocational systems produce more generally skilled students.

Educational systems thus differ in the extent and the form of their vocational training programs and whether 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 enrollment 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 labor market allocation.

The prevalence of vocational enrollment 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. Next to this, it is especially vocational programs in upper secondary education that students participate in before they enter the labor market. Data on the enrollment in upper secondary education are gathered by both the OECD (2006a) and UNESCO. To reduce measurement error, we use both indicators and perform a principal factor analysis to generate a new index of the prevalence of vocational enrollment.[8] 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 says relatively little on the specificity of skills that is taught in these programs. Especially when vocational education takes place in a dual form (school-based and work-based), specific skills are provided. Students who participate in a dual system work and study at the same time, based on the idea that the important skills are best learned on the job. The practical skills they learn are highly job-specific. The strength of the dual system, and thus the specificity of skills, is measured by a single indicator: the percentage of upper secondary vocational education that takes place in a dual system (OECD 2007). Both indicators can be found in table 1.

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

The Statistical Association between the Three Indicators

Although the indicators of vocational orientation and tracking are presented separately, they are correlated with each other. When there are only a few educational tracks for all students, it is highly unlikely that the focus of those tracks is vocational, and even more unlikely that it is then taught in a dual system. Some level of tracking seems therefore 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. It should be noted that the OECD (2005a, 2006a) created one index of tracking that combines tracking institutions with vocational enrollments.

However, we follow the stratification literature in examining tracking and vocational orientation separately (Shavit and Müller 1998; Brunello and Checchi 2007; Bol and Van de Werfhorst 2011). Also, there are vocational programs in educational systems with only a little tracking (e.g., Norway; see fig. A1 in the online version of the journal). Similarly, in strongly tracked educational systems, it is possible that the vocational orientation is limited (e.g., Turkey). In figure A1, 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, it is far from perfect. In similar fashion, the indicator for vocational specificity (dual-system participation) is related to the index of vocational enrollment, albeit imperfectly. Statistically it seems indeed useful to separate these dimensions, as the pairwise 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 $r = 0.54$.

Dependent Variables

The dependent variable we use to test our first hypothesis is youth unemployment as a ratio of adult unemployment. This variable, which is also used by Richard Breen (2005), has the advantage that it indicates 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 the year 2002.[9]

Our second hypothesis is tested by using the average length of job search as the 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), which measures the length in years before school-leavers find their first serious job.

A third dependent variable that we use to test the labor market allocation

[9] The data we use are not available for all years and all countries, and it is therefore inevitable that different indicators are sometimes used for different years. Our general strategy was to use the data that were closest to 2006 as possible. No data that we use deviate from this year with more than four years.

function of tracked educational systems is the strength of the relation between education and labor market position. We operationalized this 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 occupational status is estimated by using data from the International Social Survey Programme (ISSP) of 2008.[10] Occupational status is measured by using the International Socio Economic Index (ISEI) by Harry Ganzeboom, Paul de Graaf, and Donald Treiman (1992). For each country, we regressed occupational status on years of education.[11] We ran these regressions only for men between 25 and 40 years of age to make sure that country variation in gender effects or cohort differences do not show up in the effect sizes. We saved the *b*-coefficients of the effect and used these in the country-level regressions. However, since 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.[12]

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, they are expected to spend more time in the same occupation. We measured this 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 their online database.[13] It should be noted that this measure may be affected by the average age of entering the labor force in a country, which is plausibly 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,[14] a cross-national survey from

[10] The ISSP is an annual cross-national survey. Each participating country draws a representative sample from their population (the sample size per country is about 1,500). More information can be found at http://www.issp.org.

[11] Years of education is the most appropriate measure, as it is calculated 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 old.

[12] It must be noted that 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 uncertainty of the effect size at the individual level into account.

[13] The database can be found at http://stats.oecd.org.

[14] The PISA study of 2009 draws a random sample at both school and individual levels in 65 countries. Fifteen-year-old students are tested on three domains: reading, science, and mathematics. Next to this, students are surveyed on a large selection of background variables. More information on the PISA study can be found at http://www.pisa.oecd.

the OECD that tests the cognitive performance of 15-year-old students. As a measure, we take the difference in reading test scores between children from a low social background and a high social background.[15] This indicator measures 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 test 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 larger 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, we use data from the European Social Survey (ESS) of 2008, where we regressed years of education on the father's level of education when the respondent was 14 years of age.[16] Again we restricted the sample to men between 25 and 40 years of age. Father's education is measured in five categories,[17] and since we are interested in the effect size, we summarized the dummy variables in one single effect size by using the sheaf coefficient (Heise 1972).[18] This method gives us one effect size (instead of a separate *b*-coefficient for each dummy) for father's education on the years of educational attainment per country. For this dependent variable, we used 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; the standard errors that were used as sampling weights for hypotheses 3 and 6 can be found in appendix B in the online version of the journal.

Control Variables

Although our focus is on educational systems, there are several other possible explanations for cross-national variation that could affect our six dependent variables. A first control variable is gross domestic product (GDP) per capita, measured in 2006 US dollars, which is derived from the World Bank online database.[19] However, the general wealth of a country does not

[15] We use reading, since it was the major domain of the PISA 2009 study and was therefore more extensively tested than science or mathematics. If we would use a combined scale of all three domains, the results would be the same.

[16] The European Social Survey is a biannual 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 at http://www.europeansocialsurvey.org.

[17] These five categories are less than lower secondary education (ISCED 0–1), lower secondary education completed (ISCED 2), upper secondary education completed (ISCED 3), postsecondary nontertiary education completed (ISCED 4), and tertiary education completed (ISCED 5–6).

[18] 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's denote the dummy variables for father's education, is calculated according to the following formula: $b_{\text{sheaf}} = (b_1^*X_1) + (b_2^*X_2) + (b_3^*X_3) + (b_4^*X_4)$. 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 $y = a + b_{\text{sheaf}}X_{\text{sheaf}} + e$. For more information on this procedure, see Heise (1972).

[19] The online database of the World Bank can be found at http://data.worldbank.org.

TABLE 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	.47
Belgium	2.60	2.90	3.93	1.90	139.28	.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	.38
Denmark	1.80	2.80	1.93	1.50	120.75	.31
Finland	2.60		2.73	1.10	70.50	.33
France	2.60	2.80	2.04	1.70	149.49	.52
Germany	1.20	1.50	3.28	2.30	153.13	.37
Greece	3.30	4.40			105.14	.29
Hungary	2.50	4.70		2.20	154.28	.46
Iceland	2.90			1.70	70.17	
Ireland	2.20		2.63	2.10	111.95	.35
Israel	2.40			2.40	118.37	.37
Italy	3.70	3.40			103.85	.51
Japan	2.10		2.49		89.89	
Korea			3.34		84.97	
Luxembourg	3.20	2.60		2.30	134.87	.54
Netherlands	2.30	2.00	1.61	2.80	103.77	.36
Norway	3.70		1.63	1.60	86.10	.40
Poland	2.60	3.40	3.11	1.90	116.56	.44
Slovakia	2.40	2.80	3.55		129.09	.36
Slovenia	3.20		3.02		120.27	.36
Spain	2.30	4.40	2.26	1.60	106.25	.45
Sweden	3.00	2.80	3.06	1.30	113.85	.31
Switzerland	2.30	2.00	2.70	2.20	113.26	.39
Turkey	2.40		2.79		126.41	.43
United Kingdom	2.80	2.60	3.41	2.00	111.49	.27
United States	2.60		2.86		123.28	

NOTE.—Sources can be found in the article. All empty cells indicate missing values for these variables. In the regressions, the dependent variables *Effect of years of education on ISEI* and *Effect of social origin on years of education* are weighted for the standard error in the effect size. These data can be found in appendix B (available online).

necessarily tell us something about the investment in education; therefore, we add a second control variable to all equations, which 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 deal with the labor market, and thus we need to control for cross-national differences in labor market processes as well. Because labor entry is more difficult with greater employment protection (Nickell 1997), we first add the Employment Protection Legislation index of 2008 (OECD 2008b). 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, in the fifth and sixth hypotheses, we examine student performance and level 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 interactive online database from PISA 2006.[20] All control variables can be found in appendix C in the online version of the journal.

Results

All 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 focus on the other side of the trade-off: the (in)equality of educational opportunity.

Labor Market Allocation

All the results of the regressions are shown in table 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; tracking has no effect on the youth/adult unemployment ratio. Surprisingly, the level of vocational enrollment is positively related to youth unemployment. This effect does, however, disappear 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 the strength of the dual system reduces youth unemployment, rather than the sheer size of vocational enrollments. We therefore confirm our first hypothesis: in countries with a stronger emphasis

[20] This database can be found at http://pisa2006.acer.edu.au/interactive.php.

TABLE 3
REGRESSIONS FOR 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	−.171	−.121	.141	−.048	.393**	.477**	.317***	.328***
	(.106)	(.139)	(.173)	(.219)	(.153)	(.204)	(.080)	(.105)
Vocational enrollment	.354***	.252	−.910***	−.708**	−.036	.137	−.067	−.125
	(.125)	(.146)	(.272)	(.283)	(.174)	(.152)	(.132)	(.139)
Vocational specificity (dual system)	−.024***	−.025***	−.015	−.011	−.009	−.014**	.001	−.001
	(.006)	(.007)	(.009)	(.011)	(.006)	(.007)	(.005)	(.005)
GDP per capita		−.004		−.024*		−.002		−.001
		(.007)		(.012)		(.010)		(.006)
Government educational spending		.070		.017		.040		−.045
		(.050)		(.127)		(.051)		(.054)
Employment protection		.333*		.505		−.615***		−.150
		(.190)		(.364)		(.179)		(.157)
% unemployed		−.050		−.083		.109		−.095
		(.060)		(.100)		(.062)		(.058)
Constant	2.801***	1.708	3.843***	3.678	3.054***	3.283***	1.960***	3.527***
	(.117)	(.992)	(.244)	(2.096)	(.153)	(.977)	(.116)	(1.013)
R^2	.44	.56	.63	.76	.28	.58	.55	.72
Observations	28	27	17	17	23	22	19	19

NOTE.—Based on calculations with data from tables 1 and 2 and appendix C (available online). The results in the models without controls remain the same with a constant sample (equal sample to the models with controls). In models 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.

* $P < .10$.

** $P < .05$.

*** $P < .01$.

on vocational education (in the form of a dual system), youth unemployment is lower. Of all control variables, only the 2008 employment protection index has a significantly positive effect on youth unemployment. This gives support for the idea that in countries with a more strict employment protection, the labor market is less dynamic and thus school-leavers have more difficulty 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 tends to be shorter. Even after controlling for wealth, government expenditure 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 searchers need less time before they enter their first serious 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. None of the other two 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 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. 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 15–24-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 spent more time in the same job. When students are sorted in different tracks, they become 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 confirm all four hypotheses related to labor market allocation. This gives strong evidence for one side of the trade-off: both

TABLE 4
REGRESSIONS FOR THE DEPENDENT VARIABLES ASSOCIATED WITH THE 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*	.033**	.059*
	(4.161)	(5.922)	(.012)	(.027)
Vocational enrollment	−4.383	−4.168	−.004	−.019
	(4.888)	(5.159)	(.019)	(.022)
Vocational specificity (dual system)	.183	.262	−.001	−.001
	(.251)	(.281)	(.001)	(.001)
GDP per capita		−.022		.001
		(.207)		(.001)
Government educational spending		−1.698		.003
		(1.758)		(.012)
% public schools		.006		.001
		(.182)		(.001)
Constant	11.988***	133.345***	.385***	.232
	(4.489)	(30.184)	(.020)	(.175)
R^2	.40	.49	.19	.39
Observations	29	25	23	19

NOTE.—Based on calculations with data from tables 1 and 2 and appendix C (available online). The results in the models without controls remain the same with a constant sample (equal sample to the models with controls). In models 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.

* $P < .10$.

** $P < .05$.

*** $P < .01$.

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 of positive effects of the vocational orientation than of tracking, per se.

Inequality of Educational Opportunity

In table 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, variation in student performance is more strongly based on 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 there-

fore confirmed. None of the control variables seems 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. In model 4, when we add our control variables, which all give nonsignificant effects, we see that this effect is persistent. Our sixth hypothesis is therefore confirmed as well.

While the results from table 3 show that tracking and vocational educational programs have beneficial effects for the labor market allocation, the opposite can be said for the equality of educational opportunity. In more tracked educational systems, social background is a stronger determinant for an individual's opportunities in school. The vocational orientation of educational systems is, however, much less important than the tracked nature of secondary education.

Conclusion

In this article, 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 those systems that better prepare young people for the labor market tend to promote less equality of opportunity? Our newly developed indicators of the level of tracking and vocational orientation of educational systems confirm exactly such a trade-off. Differentiation in educational systems improves the allocation of school-leavers to the labor market but at the same time increases the inequality of educational opportunity.

We 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 change. The skill demands for many occupations changed, and in order to cope with this shift in demand, different tracks (both general and vocational) were set up. A second perspective sees differentiation in educational systems as a way to institutionalize social distances in the educational system. Differentiation is a way by which the elite coped with the increasing access to education for lower class children.

Our empirical results give 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 allocated to the labor market faster. 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 to a larger extent determined by social origin. The same pattern is found for the effect of social origin on occupational status, which is stronger in countries with more tracked educational systems.

Our data suggest 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. By contrast, when it comes to labor market access, it is particularly the 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 variation between countries in the advanced stages of secondary (and tertiary) education. Therefore, our findings illustrate that the trade-off would potentially become less prominent, giving room to a combined focus on good labor market allocation and reduced inequalities, if tracking at the earlier stages of secondary education were limited, whereas a strong vocational orientation, including a dual system with strong involvement of employers, would become more prominent in educational systems. Given that our findings are persistent after including a number of relevant control variables that are known to affect inequalities and labor markets, such a conclusion would be 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 Thomas H. Marshall (1950) and later scholars have argued (e.g., Benavot 1983; Lucas 1999), such a policy implementation may perhaps not be expected, irrespective of our findings.

References

Allmendinger, Jutta. 1989. "Educational Systems and Labor Market Outcomes." *European Sociological Review* 5:231–50.

Andersen, Robert, and Herman G. Van de Werfhorst. 2010. "Education and Occupational Status in 14 Countries: The Role of Educational Institutions and Labour Market Coordination." *British Journal of Sociology* 61:336–55.

Archer, Margaret S. 1979. *Social Origins of Educational Systems.* Beverly Hills, CA: Sage.

Arum, Richard, and Yossi Shavit. 1995. "Secondary Vocational Education and the Transition from School to Work." *Sociology of Education* 68:187–204.

Ayalon, Hanna, and Adam Gamoran. 2000. "Stratification in Academic Secondary

Programs and Educational Inequality in Israel and the United States." *Comparative Education Review* 44:54–80.
Bell, Daniel. 1973. *The Coming of Post-industrial Society*. New York: Basic.
Benavot, Aaron. 1983. "The Rise and Decline of Vocational Education." *Sociology of Education* 56:63–76.
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* 29:119–32.
Boli, John, Francisco O. Ramirez, and John W. Meyer. 1985. "Explaining the Origins and Expansion of Mass Education." *Comparative Education Review* 29:145–70.
Boudon, Raymond. 1974. *Education, Opportunity and Social Inequality*. New York: Wiley.
Bourdieu, Pierre, and Jean-Claude Passeron. 1977. *Reproduction in Education, Society and Culture*. London: Sage.
Bowles, Samuel, and Herbert Gintis. 1976. *Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life*. New York: Basic.
Breen, Richard. 2005. "Explaining Cross-National Variation in Youth Unemployment: Market and Institutional Factors." *European Sociological Review* 21:125–34.
Breen, Richard, and Marlis Buchmann. 2002. "Institutional Variation and the Position of Young People: A Comparative Perspective." *Annals of the American Academy* 580:288–305.
Brunello, Gabrielle, and Danielle Checchi. 2007. "Does School Tracking Affect Equality of Opportunity? New International Evidence." *Economic Policy* 22:781–861.
Buchmann, Claudia, and Hyunjoon Park. 2009. "Stratification and the Formation of Expectations in Highly Differentiated Educational Systems." *Research in Social Stratification and Mobility* 27:245–67.
Collins, Randall. 1979. *The Credential Society: An Historical Sociology of Education and Stratification*. New York: Academic Press.
Davis, Kingsley, and Wilbert E. Moore. 1945. "Some Principles of Stratification." *American Sociological Review* 10:242–49.
Eurydice. 2005. *Key Data on Education in Europe, 2005*. Brussels: Eurydice.
Fend, Helmut. 1974. *Gesellschaftliche Bedingungen Schulischer Sozialisation*. Weinheim: Beltz.
Fuchs, Thomas, and Ludger Woessmann. 2007. "What Accounts for International Differences in Student Performance? A Re-examination Using PISA Data." *Empirical Economics* 32:433–64.
Ganzeboom, Harry B. G., Paul M. De Graaf, and Donald J. Treiman. 1992. "A Standard International Socio-economic Index of Occupational Status." *Social Science Research* 21:1–56.
Grubb, W. Norton. 1985. "The Convergence of Educational Systems and the Role of Vocationalism." *Comparative Education Review* 29:526–48.
Hallinan, Maureen T. 1988. "Equality of Educational Opportunity." *Annual Review of Sociology* 14:249–68.
Hansen, Hal. 1999. "Caps and Gowns: Historical Reflections on the Institutions That Shaped Learning for and at Work in Germany and the United States, 1800–1945." *Business and Economic History* 28:19–24.

Hanushek, Eric A., and Ludger Woessmann. 2006. "Does Educational Tracking Affect Performance and Inequality? Differences-in-Differences Evidence across Countries." *Economic Journal* 116:C63–C76.

Heise, David R. 1972. "Employing Nominal Variables, Induced Variables, and Block Variables in Path Analyses." *Sociological Methods and Research* 1:147–73.

Horn, Daniel. 2009. "Age of Selection Counts: A Cross-Country Analysis of Educational Institutions." *Educational Research and Evaluation* 15:343–66.

Ianelli, Cristina, and David Raffe. 2007. "Vocational Upper-Secondary Education and the Transition from School." *European Sociological Review* 23:49–63.

Jenkins, Stephen P., John Micklewright, and Sylke V. Schnepf. 2008. "Social Segregation in Secondary Schools: How Does England Compare with Other Countries?" *Oxford Review of Education* 34:21–37.

Kelly, Sean, and Heather Price. 2011. "The Correlates of Tracking Policy: Opportunity Hoarding, Status Competition, or a Technical-Functional Explanation?" *American Educational Research Journal* 48:560–85.

Kerckhoff, Alan C. 1995. "Institutional Arrangements and Stratification Processes in Industrial Societies." *Annual Review of Sociology* 21:323–47.

Kerckhoff, Alan C. 2001. "Education and Social Stratification Processes in Comparative Perspective." *Sociology of Education* 74:3–18.

Lucas, Samuel R. 1999. *Tracking Inequality: Stratification and Mobility in American High Schools*. New York: Teachers College Press.

Marshall, Thomas H. 1950. *Citizenship and Social Class and Other Essays*. Cambridge: Cambridge University Press.

Maurice, Marc, Francois Sellier, and Jean-Jacques Silvestre. 1986. *The Social Foundations of Industrial Power*. Cambridge, MA: MIT Press.

Müller, Walter. 2005. "Education and Youth Integration into European Labor Markets." *International Journal of Comparative Sociology* 46:461–85.

Müller, Walter, and Markus Gangl. 2003. *Transitions from Education to Work in Europe*. Oxford: Oxford University Press.

Nickell, Stephen. 1997. "Unemployment and Labor Market Rigidities: Europe versus North America." *Journal of Economic Perspectives* 11:55–74.

Oakes, Jeannie. 1985. *Keeping Track*. New Haven, CT: Yale University Press.

OECD (Organization for Economic Cooperation and Development). 2005a. *School Factors Related to Quality and Equity*. Paris: OECD.

OECD (Organization for Economic Cooperation and Development). 2005b. *Education at a Glance, 2005*. Paris: OECD.

OECD (Organization for Economic Cooperation and Development). 2006a. *Education at a Glance, 2006*. Paris: OECD.

OECD (Organization for Economic Cooperation and Development). 2006b. *PISA 2006: Volume 2 Data*. Paris: OECD.

OECD (Organization for Economic Cooperation and Development). 2007. *Education at a Glance, 2007*. Paris: OECD.

OECD (Organization for Economic Cooperation and Development). 2008a. *Education at a Glance, 2008*. Paris: OECD.

OECD (Organization for Economic Cooperation and Development). 2008b. *Employment Outlook, 2008*. Paris: OECD.

OECD (Organization for Economic Cooperation and Development). 2009. *Education at a Glance, 2009*. Paris: OECD.

Pfeffer, Fabian T. 2008. "Persistent Inequality in Educational Attainment and Its Institutional Context." *European Sociological Review* 24:543–65.

Scherer, Stefani. 2005. "Patterns of Labour Market Entry—Long Wait or Career Instability? An Empirical Comparison of Italy, Great Britain and West Germany." *European Sociological Review* 21:427–40.

Schuetz, Gabriela, Heinrich Ursprung, and Ludger Woessmann. 2008. "Education Policy and Equality of Opportunity." *Kyklos* 61:279–308.

Shavit, Yossi, Richard Arum, and Adam Gamoran. 2007. *Stratification in Higher Education: A Comparative Study*. Stanford, CA: Stanford University Press.

Shavit, Yossi, and Hans-Peter Blossfeld. 1993. *Persistent Inequality: Changing Educational Attainment in Thirteen Countries*. Oxford: Westview.

Shavit, Yossi, and Walter Müller. 1998. *From School to Work: A Comparative Study of Educational Qualifications and Occupational Destinations*. Oxford: Clarendon.

Shavit, Yossi, and Walter Müller. 2000. "Vocational Secondary Education: Where Diversion and Where Safety Net?" *European Societies* 2:29–50.

Thelen, Kathleen. 2004. *How Institutions Evolve: The Political Economy of Skills in Germany, Britain, the United States, and Japan*. Cambridge: Cambridge University Press.

UNESCO. (1997) 2006. "International Standard Classification of Education 1997. Re-edition 2006." UNESCO-UIS Document UIS/TD/06-01, United Nations, New York.

Van de Werfhorst, Herman G. 2011. "Skill and Education Effects on Earnings in 18 Countries: The Role of National Educational Institutions." *Social Science Research* 40:1078–90.

Van de Werfhorst, Herman G., and Jonathan J. B. Mijs. 2010. "Achievement Inequality and the Institutional Structure of Educational Systems: A Comparative Perspective." *Annual Review of Sociology* 36:407–28.

Van Houtte, Mieke, and Peter A. J. Stevens. 2009. "Study Involvement of Academic and Vocational Students: Does Between-School Tracking Sharpen the Difference?" *American Educational Research Journal* 46:943–73.

Wolbers, Maarten. 2007. "Patterns of Labour Market Entry: A Comparative Perspective on School-to-Work Transitions in 11 European Countries." *Acta Sociologica* 50:189–210.