The Handbook of Economic Sociology

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Neil J. Smelser and
Richard Swedberg EDITORS

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25 Education and the Economy

Mary C. Brinton

IT HAS NOW BEEN over 25 years since Bowles and Gintis published their classic *Schooling in Capitalist America* (1976). In proposing that the relationship between education and the capitalist economy is best understood through the lens of Marxist analysis, the book engendered a series of far-reaching commentaries and debates. While Bowles and Gintis's conception of a "correspondence principle" that links social relationships in schools to social relationships in the capitalist workplace may not have been fully embraced by any but the most ardent Marxists, their analysis nevertheless demonstrated the fundamental importance of understanding the relationship between schools and workplaces—between education and the economy. Most importantly, their work raised crucial questions about how the intersection of the educational system and employer behaviors affects the reproduction of social class inequalities.

Contemporary economic sociologists might take note, for research on the education-economy interface has not played a prominent role in the reinvigorated American economic sociology of the past 15 years. It is not immediately clear why this should be the case, but a number of reasons may be at work. As other chapters in this volume (e.g., Zelizer; England and Folbre) note, the new economic sociology has focused heavily on studies of private for-profit enterprise, especially in the financial sector of advanced industrial economies. Educational institutions do not easily fall under this rubric. Moreover, two groups of sociologists whose work bears strongly on issues concerning the education-economy link—educational sociologists and social stratification researchers—are rarely identified (or self-identified) as economic sociologists. Whether this is due more to the organization of the sociological discipline in the United States across an abundance of substantive specialties or to differences in scholars' intellectual proclivities across the areas of education, inequality, and economy, this chapter will argue that the richness of the questions raised by the education-economy interface merit their inclusion in the collective research agenda of American economic sociology. Moreover, along with Morris and Western (1999), I will argue that if sociologists do not take up the intellectual challenges of analyzing how the institutions of capitalist economies are related to labor market inequalities among social groups, we may soon cede this terrain to economists and to political scientists.

We can conceptualize two principal intersections between education and the economy: the reciprocal effects between economic change and the expansion of schooling, especially at the level of secondary education (the macro-level intersection), and the translation of individuals' education into outcomes in the labor market (the intersection of education and the economy at the micro level). There are of course many other areas that fall under the rubric of "education and the economy," including the politics of public education spending, the ways that educational systems develop in response to national politics and to international educational models, the role of education in enhancing not just individuals' human capital but also their cultural and social capital, and many additional areas that are generally considered part of the sociology of education subfield itself. Rather than attempting broad coverage of the varied themes that could be considered to fall under the umbrella of "education and the economy," this chapter will focus on a particular conceptualization of the education-economy link. This choice is based on the fact that many single themes receive chapter-length treatment in the *Handbook of the Sociology of Education*, a very useful resource, and that in the first edition of the *Handbook of Economic Sociology*, Rubinson and Browne focused mainly on the macro-level connection between the economy and education, reviewing the main theories and bodies of empirical evidence on the effect of education on economic growth and conversely, the effect of the economy on educational expansion (1994). The present chapter will follow this by turning to the micro-level intersection—the way that individuals' education is rewarded in the

labor market—and will do so in a comparative-institutional context.

While education and stratification researchers in sociology have devoted intensive efforts to documenting inequalities among social groups in educational attainment and in the labor market rewards to that attainment, much less attention has been directed to the social-institutional underpinnings of inequality patterns—those features of educational systems and of labor markets that structure inequality among social groups. In the case of gender inequality, for example, this is partly a natural result of American stratification researchers' predominant emphasis on the United States rather than on comparisons among postindustrial societies.[1] The concentration on one national case renders consideration of the institutions underlying patterns of inequality quite difficult, as many such institutions are in effect "held constant" (see also Allmendinger 1989; Blau and Kahn 1996b; Kalleberg 1988; Müller and Shavit 1998). Yet the study of institutions—their origins, their stasis or transformation, and their effects on individual lives—is an important motivating force behind much of the sociological enterprise, especially economic sociology.

The present chapter is divided into two parts. The first half reviews recent comparative work in the social sciences (not restricted to sociology) that bears on how the educational and economic institutions of capitalism affect patterns of inequality. I attempt to provide an overview of the varied theoretical attempts by sociologists, political scientists, and economists to link inequality patterns to the institutional variation across capitalist economies. As will be discussed, these attempts typically focus *either* on the structure of the educational system *or* on specific labor market institutions (e.g., collective bargaining arrangements, unionization, or types of labor markets). These foci differ according to academic discipline and to disciplinary subfield, resulting in a sometimes confusing mélange of research articles and books.

In the second half of the chapter I suggest a conceptualization of the education-economy interface based on the institutional arrangements in the educational and the economic spheres that are responsible for two processes: (1) individuals' human capital or skill development, and (2) the recruitment of individuals into jobs. I then explore the possible relationship between different types of education-economy regimes and the degree of inequality across social groups, drawing upon empirical work from the social sciences—particularly sociology and labor economics.

In proposing that economic sociologists study how the linkage between the educational system and the workplace affects individuals, I locate human capital development and recruitment processes in the larger context of the institutions of advanced capitalism. While modern nation-states designate the formal educational system as the main locus of human capital development, education takes place in other sites as well, especially the workplace. Human capital development can thus be problematized as involving a division of labor between the educational and economic spheres (schools and firms).[2] The division of labor for human capital development becomes institutionalized in every society, and the pattern of this institutionalization generates implications for patterns of inequality.

Given that labor recruitment processes also take place within the context of existing educational and economic institutions, they too may differ in important ways across capitalist economies. The analysis of recruitment processes involves looking at how individuals are recruited into their first full-time job after (or during) completion of education as well as how individuals are recruited from one job (or from the state of unemployment) into another; that is, we need to consider mechanisms operating in the school-work transition and those operating in moves of individuals across employers or firms. In societies with very loosely coupled schools and firms, these processes may be similar to each other. Societies with close school-work linkages, on the other hand, will have mechanisms of moving youth into jobs that may be significantly different from the mechanisms governing interfirm mobility at later career stages. What are the implications of both sets of mechanisms for patterns of inequality? An ever-growing comparative literature on the school-work transition in industrial societies has provided rich descriptive information on variation in the institutions undergirding school-work processes (Shavit and Müller 1998; Rosenbaum and Kariya 1989; Ryan 2001), but the possible implications for inequality patterns remain largely unexplored.

Given the scope of the questions raised in considering how the structure of educational and economic systems affects inequality patterns via the mechanisms of skill development and labor recruitment, I further limit the scope of this chapter in two ways.

First, I focus primarily on how training and human capital development are institutionally embedded and only secondarily on how recruitment processes are similarly embedded. Granovetter's landmark work on job search in the United States has spawned a rich sociological literature on job-search and recruitment processes. That literature is

too large to consider here; moreover, only a portion of it is relevant to the present purpose of thinking through how recruitment processes are institutionally embedded.[3]

Second, I restrict the discussion of inequality to two types: the wage gap by skill/education and by gender. Both are empirically important and both vary considerably across capitalist economies with varied institutional configurations in education and the economy. American sociologists have on the one hand largely ceded the study of the skill/education wage gap to their neighbors in other social science disciplines (especially labor economics) and on the other hand have focused a great deal of attention on the gender wage gap, albeit mainly within the United States. There is a big opening for economic sociologists' expertise in institutional analysis to inform the *comparative* study of both types of inequality.

In arguing that economic sociologists turn their attention to the institutional patterning of the education-economy interface and its relationship to inequality, I end up following not so much the lead of Marx (via Bowles and Gintis) but rather Weber, as I wish to make the case that we are well equipped to approach the subject using two tools of the Weberian approach: comparative institutional analysis and ideal types (see Hamilton's chapter in the first edition of this handbook, 1994; also see Dobbin, chapter 2 in the present handbook). In the second half of the chapter I use three ideal-typical cases—the United States, Germany, and Japan—to explore how the education-economy interface structures training and human capital development and thereby affects inequality across social groups. These capitalist societies differ very considerably in the division of responsibility between the formal educational system and firms in individuals' skill development and placement into specific jobs. As such, they demonstrate that capitalist societies have specific institutional arrangements that are intimately related to the historical path of development in state-education-economy relationships. The origins of these institutional variations, as well as their implications for inequality, are important and neglected subjects for analysis by economic sociologists.

The Education-Economy Interface: Comparative Analyses

Scholarship on the institutional context governing human capital development as well as inequality is widely scattered across the disciplines of sociology, political science, and economics, and cross-references are unusually sparse. This first half of the chapter reviews key pieces in each field.

Sociological Perspectives

Within economic sociology, Fligstein has recently argued for the importance of understanding the emergence of distinct employment systems—defined as the rules that structure careers—in different capitalist economies (2001).[4] Employment systems specify the nature of the relationship between workers and employers and how control over training, compensation systems, and other aspects of employment is shared among different parties. Fligstein uses the United States, Japan, France, and Germany to illustrate variants of the three ideal-typical employment systems he identifies: professionalism, managerialism, and vocationalism.

While skill development and recruitment are a part of what Fligstein discusses under the rubric of employment systems, they are not his central focus, nor is inequality. Rather, his principal concern is to conceptualize an employment system and to explore how variance in employment systems is produced by the interaction among groups vying for control over the rules of employment. These groups include employers, workers, the state, professionals and their associations, and educators.

Fligstein's exploration of how the educational system and the organization of the firm in advanced capitalist economies interact to produce distinctive types of employment trajectories for individuals is similar to Baron and Bielby's now-classic call to "bring the firms back in" (1980) in terms of reorienting us to the study of institutions and organizations. Morris and Western also argue for such a reorientation in their analysis of research on widening wage inequalities in the United States (1999). They note American sociologists' preoccupation with the *allocation* of positions rather than with the *structure* of positions and with the institutions that create and maintain that structure (see also chap. 12 by Streeck in the current handbook). This theme is echoed in various places in the stratification literature, such as in the study of job mobility. More than a decade ago Rosenfeld suggested, "What we need is not a proliferation of 'structural' variables to include in models of job shifts, but a better understanding of the dimensions and mechanisms that define 'opportunity structures'" (1992, 57). This is representative of many sociologists' call for greater attention to the mechanisms underlying stratification and inequality.

Although individuals move between the worlds of education and work, some repeatedly across the

first half of their life cycle, when American stratification researchers pay attention to institutions, they tend to divide into those who specialize in the study of educational institutions and those who specialize on workplace institutions and labor markets.[5] This segmentation between scholars interested in education and scholars interested in employment is of course not an absolute one. Studies of intragenerational mobility have paid considerable attention to how features of the educational system structure career mobility; see for example the comparative studies of Blossfeld (1987), DiPrete et al. (1997), Haller et al. (1985), and König and Müller (1986). But in general the sociology of education literature and the labor markets literature have moved forward without a great deal of theoretical cross-fertilization regarding the ***mechanisms*** producing stratification. Moreover, the educational stratification literature has been dominated by American sociologists' abiding interest in intergenerational status or class mobility, while the labor markets literature has been driven largely by the focus on cross-sectional wage inequalities between individuals of varying ascriptive characteristics (especially race and gender). In short, separate and voluminous stratification literatures have developed side by side, with each focusing on a different set of institutions and a different dependent variable or way of measuring labor market outcomes. And while each literature has at times approached the issue of how institutional variation across capitalist economies arose and what its implications are for the structure of positions (in the educational system or in the labor market), both literatures have ultimately paid much more attention to ***who*** is selected into different positions, as Morris and Western (1999) and Streeck (in this volume) have noted.

Sociology of Education

Educational sociologists have generally considered occupational attainment to be the principal dimension of social stratification in advanced capitalist societies (Kerckhoff 2001). The effects of educational attainment on individual labor market outcomes have thus largely been studied in terms of occupational status attainment. The most ambitious comparative research agendas linking educational institutions to inequality outcomes are those represented by Allmendinger (1989), Kerckhoff (1995, 2000, 2001), and Shavit and Müller (1998). All have emphasized the considerable variation in educational systems across advanced industrial societies and the likely implications of this for individuals' labor market outcomes. In Allmendinger's words, "Educational opportunities, and the specific structures of educational systems, are as consequential for mobility in labor markets as are the attributes of the individuals who make careers in those markets." She continues, "I attempt to show that educational *systems* define occupational opportunities for individuals at entry into the labor market, and that these systems have long-term implications for how people are matched to jobs" (1989, 232).

Three dimensions of educational systems that have been particularly emphasized by sociologists of education are standardization, stratification, and vocational specificity (Kerckhoff 2000, 2001). Standardization refers to the degree of centralized decision-making over programs and curricular content, and stratification refers to the degree of students' separation into different kinds of educational programs (as opposed to following a unified comprehensive curriculum throughout their schooling). Vocational specificity signifies the degree to which educational systems offer training geared to particular occupations.

Both Allmendinger and Kerckhoff followed a strategy of examining variation in educational systems in the United States and several European societies, and generating hypotheses about how this variation contributed to labor market outcomes (measured as labor force participation and as occupational status). Ishida's three-country (United States, Japan, Great Britain) study of intergenerational mobility considered the effects of education and family background on first and subsequent occupational status (1993), paying close attention to the institutional differences in educational systems. His study was unusual in its inclusion of current income as an additional labor market outcome. Shavit and Müller's study of the transition from school to work in 13 countries represents the broadest comparative-institutional analysis to date on how educational qualifications affect occupational attainment (1998). In collaboration with several research teams, they studied the effect of educational attainment on the occupational prestige of individuals' first jobs and on individuals' probability of entering the labor force in skilled versus unskilled jobs in the 13 national settings. As Müller and Shavit note at the outset, "Countries differ in the way they organize education and channel each new generation through their diverse educational systems. Countries also differ in labour-market institutions." They stress in particular their concern with "varying institutional characteristics of educa-

tional systems and their effects on occupational outcomes" (1998, v). This passage represents nicely the *theoretical* accord paid by educational sociologists to variation in both educational and labor market institutions, and their subsequent *empirical* concentration on the first source of institutional variation—the effects of educational institutions—on individual-level outcomes.

All of the institutionally oriented educational sociologists discussed so far pay considerable homage to Maurice, Sellier, and Silvestre's *The Social Foundations of Industrial Power: A Comparison of France and Germany* (1986) as a landmark comparative study. Maurice, Sellier, and Silvestre develop a theoretical framework for the study of the links between educational qualifications and labor-market outcomes, based on how employers use workers' qualifications in the firm. Their attempt in many ways presages the "varieties of capitalism" literature in political science that I will discuss shortly. They use the contrasting cases of France and Germany to show that countries utilize different methods of developing workers' skills, and argue that this is based on the way that the educational system and the workplace work together. After making point-by-point comparisons in workplace organization, inequality between white-collar and blue-collar workers, skill training, and labor-management relations, they move to a more abstract level of analysis and argue that the relationships among these categories of analysis should congeal into "broader, permanent social trends" (1986, 155–56). In a wonderful turn of phrase, they refer to differences between France and Germany in "the logic that governs the social determination of qualification" (1986, 166). In France the "organizational domain" is central, whereas in Germany it is the "qualification or professional domain" that is crucial in determining worker mobility and rewards. As will be explored in greater depth in the three cases (United States, Germany, and Japan) utilized illustratively in the second half of this chapter, some countries have an education-economy interface that gives pride of place to standardized vocational qualifications acquired in school and in school-firm partnerships (Germany), whereas others follow a model in which the majority of workers enter the labor force with highly general educational credentials (U.S. and Japan) and firms independently assume the responsibility of providing training to workers (Japan and, to a lesser extent, the United States).

While not the central theme of their empirical work, wage inequality between workers was also examined by Maurice, Sellier, and Silvestre. They found that wage determination principles differ significantly in France and Germany, in ways that correspond to the importance of organizational affiliation versus qualifications:

> the importance attached in Germany to professional autonomy within fairly uniform strata of the work force (and to controlling worker movements within the organization) tends to make constant expansion of the job spectrum (and thus constant increase in the ratio of highest to lowest wages . . .) less inevitable than it is in France. By contrast the fact that the stability of the French system results from worker mobility within the firm tends to widen the gap between the highest and lowest wages. (1986, 171)

Their empirical analysis demonstrates that wage inequalities among industrial workers are greater in France than in Germany no matter how workers are categorized by the analyst—skilled versus unskilled, nonmanual versus manual, office versus production, supervisory versus nonsupervisory.

In their concluding chapter Maurice, Sellier, and Silvestre return to their broad comparative aim of showing the interdependencies among institutions that structure the employment relationship, arguing that the differences they observe in France and Germany "form a pattern that can be related to fundamental features of advanced capitalist societies and economies. Making this relation explicit is the fundamental goal of comparative social analysis" (1986, 195).[6] In sum, the comparative work of Maurice and his colleagues, based on extensive fieldwork and surveys in two very different capitalist economies, was a significant departure from research that looked at only one side of the education-economy interface—either the effect of the educational system on individual worker outcomes, or the rewards attached to education under different labor market structures.

Since Maurice, Sellier, and Silvestre's classic study, American educational sociologists' research on comparative educational systems and individual labor market outcomes has produced a significant body of information about the contours of institutional variation in education across advanced industrial societies, especially those in Europe and North America. The broad conclusions of the literature include a set of generalizations about how standardization, stratification, and vocational specificity affect the occupational status of individuals or their prospects for intergenerational status mobility (see Müller and Shavit 1998 for a review). But educational sociologists have not necessarily taken

up the gauntlet thrown down by the classic France-Germany comparison to develop an ***integrated theory*** of how educational systems and employment systems are linked, and how this linkage affects inequality patterns. As Kerckhoff stressed throughout his body of comparative-institutional work on social mobility, the institutional arrangements of education and work are interrelated, and together they organize stratification processes; as Maurice et al. showed, this applies not only to the attainment of occupational status and social mobility but also to ***wage differences*** among groups of workers, the point taken up in the second half of this chapter.

Labor Market Segmentation

The sociological literature on labor market inequality has developed orthogonally to the literature on the structure of educational systems and inequality. This is ironic given the shared emphasis of the two literatures on institutions and structure. Labor market theorists in economics and sociology developed a structuralist critique of the neoclassical paradigm in the late 1970s and 1980s that emphasized the segmentation of the labor market. Doeringer and Piore's work on internal labor markets (1971) is usually referred to as the early harbinger of these studies, which proceeded in sociology along two lines: theoretical attempts to develop a labor market typology that could capture the relevant differentiation among labor markets, and empirical attempts to link the structure of labor markets to the wages of individuals, especially by race and gender. It is not necessary to attempt to summarize here these two voluminous literatures, as excellent summaries exist elsewhere (see, for example, Althauser 1989; Rosenfeld 1992). Instead I will note some of the characteristics of the sociological labor markets literature that have perhaps made it less informative than it might be for our understanding of the relationships between the education-economy interface and patterns of inequality.

First, education in the form of on-the-job training played an important role both in Doeringer and Piore's work and in many of the subsequent attempts to construct labor market typologies, with firm-specific training being an important identifying characteristic of the prototypical firm-internal labor market. But the relationship between the organization of training systems in firms to national educational systems was rarely mentioned; as in the sociology of education literature, the education-economy link was undertheorized. This may be partly attributable to the fact that the labor market segmentation literature mainly grew up in the American context and did not proceed to develop in a fundamentally comparative direction. There was, therefore, no natural theoretical possibility for conceptualizing the relationship between skill development in firms and in the educational system.

Second, when labor market segmentation theory ***was*** applied to other countries, it tended to be just that: the application of a labor market typology derived in the American context to another national case. These one-country studies by and large focused on a subset of the issues American researchers had investigated in the United States: the extent to which a given form of labor market segmentation characterized an economy, and how it affected the mobility of workers across jobs. For example, Blossfeld and Mayer (1988) looked at labor market segmentation in Germany and concluded that barriers to mobility across sectors are more structured by the importance of qualifications than by firm size and firm-internal versus external recruitment practices. (This nicely parallels Maurice, Sellier, and Silvestre's more qualitative analysis.) Similarly, many scholars have commented that the segmentation of labor markets in Japan represents a quintessential "dualism" (between the large-firm or primary sector and the small-firm, secondary sector); within the large-firm sector, Japanese firm-internal labor markets constitute virtually a textbook version of internal labor markets (Brown et al. 1997; Kalleberg and Lincoln 1988; Sakamoto and Chen 1993; Spilerman and Ishida 1996).

The labor market literature, then, is nearly silent on the issue of how labor market structuration is related to patterns of inequality across capitalist economies. Moreover, as Morris and Western note, neither labor market sociologists nor other stratification researchers have picked up on the empirical importance of the greatly widened wage gap by skill/education in the United States versus other countries in the past two decades. A result is that some important theoretical opportunities have been forgone. Sociologists have made surprisingly few attempts to make generalizations about how the nature of the wage determination process, as embodied in labor market structures, affects either the gender wage gap or the education wage gap. On the gender wage gap, most stratification researchers would likely agree with a statement such as, "Economies that have many firms with internal labor markets tend to exhibit high gender inequality." But oddly, it is virtually impossible to find

such statements in the literature.[7] In their study of the gender wage gap in four countries, Rosenfeld and Kalleberg remarked that "systematic cross-national statistical analyses of the earnings gap are rare" (1990, 70). Unfortunately, this statement is still surprisingly accurate, even though most sociologists would agree with the conclusion reached even earlier by Treiman and Roos and cited by Rosenfeld and Kalleberg: income determination processes seem to indicate "deeply entrenched institutional arrangements that limit women's opportunities and achievements" (Rosenfeld and Kalleberg 1990, 70).

Why have stratification researchers neglected the "big picture" of labor market structures' effect on the gender wage gap? Part of the answer lies undoubtedly in the fact that micro-level data on wage determination are hard to come by for many countries. But as I discuss below, this has not deterred labor economists from producing comparative research on the wage gap by gender as well as by education. Labor economics at the beginning of the twenty-first century boasted a much larger comparative literature than social stratification research on the role of institutions in exacerbating or compressing wage gaps. Many of these analyses have been carried out with aggregate data, so perhaps sociologists' preoccupation with individual-level data partly explains the collective reticence. Another reason may be the preoccupation of gender stratification researchers since the 1980s with occupational sex segregation and its contribution to the gender wage gap. This preoccupation may be misplaced in comparative studies of gender inequality, as occupational sex segregation is not necessarily predictive of cross-national variation in the gender earnings gap (Brinton 1993; Brinton and Ngo 1993; see also OECD 2002, table 2.17; and Rosenfeld and Kalleberg 1990). Focusing instead on the gender wage gap and on the institutional arrangements that appear to widen it—such as internal labor markets—may be a much more fruitful strategy.[8]

Sociological labor market researchers' neglect to study the institutional determinants of the skill gap in wages in industrial societies is also rather remarkable given the empirical importance of this gap and the dubious distinction of the United States in exhibiting wide wage differentials compared to all of its industrial counterparts save the United Kingdom. As with gender inequality, a major issue here is the set of choices American researchers have made vis-à-vis dependent variables: just as sociology of education researchers have concentrated on occupational status and intergenerational mobility, labor market researchers have concentrated on mobility across sectoral boundaries. The latter have largely conducted research in the context of one economy at a time.

Political scientists and economists have produced bodies of research on the relationship between capitalist institutions and inequality that are highly relevant for economic sociologists interested in the education-economy link. I turn first to the political science literature, with which many economic sociologists may be less familiar than the labor economics literature.

The Welfare State and "Varieties of Capitalism"

As reviewed by Huber and Stephens in chapter 24 of this handbook, Esping-Andersen conceptualized three ideal-typical welfare regimes in his seminal 1990 volume *The Three Worlds of Welfare Capitalism*—the social democratic, conservative, and liberal—based on the types and sources of social protection provided to citizens (Esping-Andersen 1990). His typology spawned a very extensive literature, some of which looks at the distributive implications of different welfare-state regimes. Gender inequality is one such distributive implication (Gornick, Meyers, and Ross 1998; Orloff 1993), as is the poverty rate (see Huber and Stephens, especially their table 1, in this volume). Save a few related efforts such as Chang's development of a typology of "occupational sex segregation regimes" (2000), the mainstream social stratification and labor markets literature in sociology continues to show almost no relationship to the burgeoning welfare-state literature in political science and sociology. But the recent "varieties of capitalism" scholarship, located in the welfare state tradition in political science, is particularly relevant to theorizing how the education-economy interface affects stratification outcomes.

Proponents of the varieties of capitalism approach share the concern of other welfare state theorists with how the provision of social protection (e.g. employment, unemployment, and wage protection) varies across advanced industrial democracies. Their main focus is on production regimes and their complementarity with social policies (Estevez-Abe, Iversen, and Soskice 2001; Hall and Soskice 2001; Hollingsworth and Boyer 1997). Production regimes are conceptualized as the institutional configurations that lead to an economy's particular set of product strategies for the international market. An important part of such strategies is the development and maintenance of labor force skills. For instance, economies that de-

velop high-quality products for niche markets require workers that are highly skilled in specific industries. Alternatively, economies that specialize in mass-produced goods require a labor force with basic literacy but fewer industry- or firm-specific skills. In recognizing such distinctions, varieties of capitalism scholars bring employers' interests in workers' skill formation and protection into the picture in a more central way than does the welfare-state literature. This theoretical turn toward the middle range (organizational and employer interests) is strikingly similar to what Fligstein does in his analysis of employment systems.

In work that is particularly relevant for stratification researchers and economic sociologists interested in the education-economy link, Estevez-Abe, Iversen, and Soskice (2001) seek to demonstrate the complementarity between systems of social protection and skill development regimes on the one hand, and the resulting implications for wage inequality on the other. Their argument is that different systems of social protection affect individuals' (employers' as well as workers') incentives to invest in particular types of skills. They identify three types of skill-formation regimes, and these correspond respectively to Fligstein's professional, managerial, and vocational models of employment systems: regimes that emphasize general skills, firm-specific skills, or industry-specific skills. Unlike Fligstein, Estevez-Abe, Iversen, and Soskice's goal is not to explain the origins of these regimes or systems. Rather, their aim is to explore the implications of these regimes for wage inequality across social groups. As they state, "Some skill equilibria—sustained by different systems of social protection—produce more inequalities based on the academic background of workers, while others produce more inequalities based on gender" (2001, 147). Categorizing skills as general, industry-specific, or firm-specific, Estevez-Abe argues that skill regimes that concentrate on firm-specific skills are the most disadvantageous to women (2002). This is because women have less incentive to invest in these skills if they anticipate breaks in employment due to family responsibilities, and employers likewise have less incentive to invest in women than in men, as the latter can be assumed to have more continuous work histories. This argument effectively moves in the direction of comparative inquiry into the relationship between skill-formation regimes and gender inequality.

Labor Economics

Finally, a quite orthogonal literature that speaks to the education-economy interface and its implications for inequality is in labor economics. A standard complaint in much of the economic sociology literature is that American economists do not pay sufficient attention to institutional contexts. For the case of comparative gender inequality, this is a point well taken. Like sociologists, labor economists have devoted many more pages to gender inequality in the United States than to the standing of the United States relative to other industrial countries (but see the recent landmark comparative work of Blau and Kahn 1996a, 1996b, 2002). Pride of place is usually given to individual earnings equations and especially to the role of women's differential human capital across countries in contributing to the gender gap in earnings. Because analyses of the gender wage gap must necessarily pay attention to the relative educational composition of the male and female labor force and the relative propensities for some groups of women to exhibit discontinuous work histories, attention has also been paid to labor market policies that make it easier or harder for women to combine family and work life. The indirect effect of wage-setting institutions on the gender wage gap has also been given considerable attention (Blau and Kahn 1996b). But how training is orchestrated between schools and firms has not surfaced as a central institutional factor in economists' analyses of gender wage inequality.

In their analysis of the recent increase in earnings inequality by skill level, however, leading American labor economists have devoted considerable attention to labor market institutions in the past 15 years. Wage inequality between high- and low-skilled workers increased sharply in two industrial democracies in the 1980s: the United States and the United Kingdom. These two stood apart from other OECD economies, which showed varying education-wage trajectories (Blau and Kahn 1996a, 2002; Card and DiNardo 2002; Freeman and Katz 1995; Gottschalk and Joyce 1998; Gottschalk and Smeeding 1997; Juhn, Murphy, and Pierce 1993; Katz and Autor 1999). Labor economists have devoted considerable research effort to documenting the cross-country trends and to exploring the reasons why the returns to education increased so dramatically in the United States and United Kingdom. Under the direction of Richard Freeman, the National Bureau of Economic Research (NBER) initiated a Comparative Labor Markets series that has produced a number of edited volumes examining the contours of wage inequality across advanced industrial economies. NBER-affiliated economists produce such a steady stream of papers on wage inequality that it is hard

to keep up with their collective output. While these studies are predictably impressive in quantitative sophistication, they are also impressive in their comparative breadth. Even more striking from a sociological viewpoint, many of the papers pay considerable attention to labor market institutions and policy.[9]

The labor economics literature has produced broad agreement over the facts of increased wage inequality by skill level, as well as a dominant orthodoxy about some of the major causes. Chief among these are two: (1) in the United States and the United Kingdom, the demand for skilled labor in the past two decades outpaced the increase in supply, thereby pushing up skilled wages; and (2) the wage-compression effect of wage-setting institutions in continental European countries played a key role in forestalling large increases in the skill gap in pay in those countries. The latter explanation is an institutional one, centered on how variance in wage-setting institutions across advanced industrial economies affects wage dispersion across less- and more-skilled workers. The labor economics literature thus shares with the political science literature an emphasis on the importance of wage-setting institutions in exacerbating or dampening wage inequality. Labor economists focus heavily on the fact that the U.S. labor force has a low unionization rate relative to most other industrial countries and that collective bargaining in the United States is decentralized. Local unions play a greater role than broader wage-setting institutions in the United States, and there is a prevalence of single-firm agreements (Blau and Kahn 2002; Freeman 1994).[10] For these reasons, labor economists are in broad agreement that the United States represents an extreme in terms of the absence of coordinated labor market institutions and regulation.

Nevertheless, there seems to be general agreement among labor economists that changes in the relative supply of skills and the wage-compression effects of labor market institutions in many European countries do not fully explain the variation in wage inequality trends across countries. A third explanation involves the effect of technology adoption on the demand for highly skilled workers.[11] The role of technology in explaining international comparisons has been a subject of intense debate (Autor, Katz, and Krueger 1998; Bound and Johnson 1992; Card and DiNardo 2002; Juhn, Murphy, and Pierce 1993; Krueger 1993; Murphy and Welch 1993). DiPrete and McManus (1996) offer an excellent critique of labor economists' strong focus on the effects of technology on wages. More importantly, they point out that when the economic literature turns to institutional explanations the emphasis is rather single-mindedly on unions and wage-setting institutions.

From the viewpoint of this chapter, there are two additional theoretically intriguing institutional possibilities in the labor economics literature. The first concerns the interaction between technology adoption and a country's existing skill bias. Acemoglu (2002) argues that the relative demand for skilled labor (irrespective of supply) simply did not increase as much in continental Europe as in the United States. He develops a theoretical framework wherein changes in employers' relative skill demands depend partly on the perceived substitutability of skilled and unskilled labor. In most continental European economies, employers pay higher wages to unskilled workers than they would in the absence of labor market institutions that raise the "floor" (minimum wage). Given that employers are already paying relatively high wages to their unskilled workers, they have an incentive to increase the productivity of these workers. "Put differently, the labor market institutions that push the wages of these workers up make their employers *the residual claimant* of the increase in productivity due to technology adoption, encouraging the adoption of technologies complementary to unskilled workers in Europe" (2002, 7–8). Because of this, there may have been a smaller increase in the demand for skilled workers in Europe than in the United States in the past two decades.[12]

Acemoglu's theoretical framework is intriguing in that he posits an interaction between technology adoption and the existing relative wages in the economy; employers' use of technology is at least in part endogenously driven by the socially and politically determined wage structure. In contrast to the argument in some of the labor economics literature that a compressed wage structure reduces employer investments in human capital, Acemoglu and Pischke suggest that such a wage structure may instead *encourage* employers to provide general training to workers, including the less skilled. They write, "we expect that European and Japanese labor market institutions may increase one of the components of investment in human capital, firm-sponsored general training, and possibly even contribute to total human capital accumulation" (1999, 542). I return to this comparative prediction in the second half of the chapter.

A fourth explanation for how some countries were able to maintain fairly low wage inequality throughout the 1980s and early 1990s involves the use of training strategies (Freeman and Katz 1995). This appears to be the most underexplored

of the institutional explanations in the labor economics literature, far surpassed by the focus on wage-setting institutions. At the end of their review of comparative wage inequality trends in the mid-1990s, Freeman and Katz note the following:

> Germany and Japan appeared fairly successful through much of the 1980s in maintaining the earnings and employment of non-college-educated workers. German institutions constrain wage setting, *but they also offer apprenticeships and further training opportunities that try to make supply consistent with wage policies.* The Japanese have succeeded with basic education and much informal firm-based training. . . . international differences in recent labor market experiences strongly suggest that policies to buffer the earnings of the less educated by institutional wage setting work best *when accompanied by institutions that augment those workers' skills as well.* (1995, 20–21; emphasis added)

The suggestion that training policies may augment wage-setting institutions' compression of the skill wage gap is connected with the varieties of capitalism literature that discuss skill formation regimes. It does not appear that these two groups of scholars—labor economists versus political scientists developing the varieties of capitalism approach—are engaged in sustained dialogue with each other, but from the viewpoint of economic sociologists there is an interesting synergy here. It is also worth noting that these two sets of scholars are highly sensitive to the range of institutional alternatives in contemporary capitalism. This is of course a central assumption in economic sociology.[13] But as I have argued, it has not necessarily been an assumption shared by stratification researchers in sociology, especially those working in the status-attainment tradition and concentrating on intergenerational mobility.

This part of the chapter has reviewed literature in four areas—two subdisciplines of sociology (sociology of education and sociology of labor markets), political science, and labor economics—to identify the dominant conceptualizations of institutions as they relate to inequality patterns. While a few scholars have attempted to conceptualize the education-economy link as it bears on inequality, these attempts have been scattered and there has been little cross-fertilization on the theoretical front, especially across disciplinary boundaries. The dominant mode has been for researchers to choose features of *either* the educational system or the economy and theorize about the implications for inequality. Each subfield or discipline has also privileged certain outcomes or dependent variables over others. Table 1 summarizes the institutions that each discipline or subdiscipline emphasizes and the inequality outcomes to which it pays the greatest attention.[14]

In the remainder of the chapter I explore a formulation of the education-economy link that can be termed an economy's *human capital development system,* and I suggest that it may have potential explanatory power for inequality patterns. I do not mean to argue that this is a panacea for the cacophony of partial conceptualizations of the education-economy interface. But I do argue that economic sociologists have a comparative advantage (to make an unfortunate pun) in doing comparative-institutional analysis of how societies organize *in tandem* their educational systems and labor markets. Among the fields surveyed in this chapter, the ones that come closest to doing this are labor economics and the varieties of capitalism approach in

TABLE 1. Analysis of Institutions and Inequality, by Discipline

Discipline or Subdisciplinary group	*Institutions Used as Independent Variables*	*Dependent Variables*
Sociology of education researchers	Characteristics of educational systems	Occupational status; skilled vs. unskilled work; intergenerational social mobility
Labor market sociologists	Types of labor markets	Wage inequality by race and gender; job mobility; occupational sex segregation
Welfare-state and "varieties of capitalism" researchers	Wage-setting institutions; "production regimes" and "skill development regimes"	Distribution of income inequality; gender wage inequality
Labor economists	Wage-setting institutions; unions	Distribution of income inequality; gender wage inequality

political science. But both underemphasize the importance of how the educational system operates in conjunction with workplace training systems; they concentrate instead on training in the workplace.

To demonstrate some of the cross-national variance that exists in the configuration of institutions governing human capital development, I use the cases of the United States, Germany, and Japan. The institutional configurations in these countries were produced by very different historical circumstances surrounding the development of the "modern" educational system and employment relations during industrialization. I suggest that the resulting human capital development systems have implications for cross-national variation in the education (skill) wage gap and the gender wage gap. This approach takes variation in the institutional arrangements of capitalism as a natural outcome of different historical trajectories initiated in the course of industrialization.

I restrict the ensuing theoretical and empirical exploration to two types of inequality: (1) the education wage gap,[15] and (2) the gender wage gap.[16] To reiterate briefly why these and not others: First, I have shown that the dependent variables used in the analysis of inequality vary tremendously across disciplines. These disciplinary interests can be bridged by a focus on how different educational attainments as well as gender translate into wages in comparative settings. Second, skill/education and gender inequality show considerable variation across national cases that vary institutionally (in their education-economy linkages), making exploration of the possible relationship to institutional configurations an important one. Third, both the education wage gap and the gender wage gap changed substantially in magnitude—and in opposite directions—in the United States during the last few decades of the twentieth century. Wage differentials by education widened markedly in the late-twentieth-century United States, whereas the gender wage gap changed in the opposite direction, narrowing more since 1980 than in any other period in the century. Particularly in the case of the education wage gap, the United States (along with Great Britain) represents an important deviation from the trajectory of change in other OECD countries.

Human Capital Development Systems and Inequality

The United States, Germany, and Japan demonstrate radically different systems for educating, training, and recruiting workers. This is due to the very different types of education-economy interfaces that developed historically and have persisted in the three countries. Following terminology I developed in earlier work on gender stratification (1988, 1993), I suggest that it makes sense to think of countries exhibiting different *human capital development systems.* These systems are defined by how the division of labor for human capital development is shared across institutions. This division of labor may have implications for the degree of gender inequality in an economy because it affects who is responsible for human capital development decisions and how the timing of these decisions is distributed across the life cycle. For the purposes of this chapter, the most important characteristics of a human capital development system are the relative role played by employers versus schools, and the way that recruitment into work is structured. The human capital development systems epitomized by the United States, Germany, and Japan demonstrate varied implications for gender wage inequality and for the education wage gap as well.

Table 2 presents the three ideal-typical institutional arrangements governing skill development that are represented by the United States, Germany, and Japan; alongside these are the resultant dominant forms of human capital in each economy. As developed by Becker, human capital theory distinguishes between general and specific skills (1993). The worker invests in and reaps the return from general skills, which are portable across employers. Worker's specific skills, on the other hand, are also invested in by the employer and are particularly useful to him or her. I suggest that the United States, Germany, and Japan represent a continuum in terms of employer involvement in skill development. The United States shows considerable variation across employers in terms of the degree to which they train their own workers; German employers invest in worker training through their participation in apprenticeship programs that have a high level of standardization through occupational certification; and Japanese employers invest individually in worker skills and use compensation rules that highly reward length of tenure. The German case therefore represents a concentration on a type of skill that is occupation-specific rather than general or firm-specific. The returns to occupational skills are shared more collectively across employers than is the case with firm-specific skills, as occupational certification standards confer a degree of interfirm portability. Firm-specific skills, represented by the Japanese case, are the

TABLE 2. Comparative Human Capital Development Systems and Inequality

Country	*Dominant Site of Human Capital Development*	*Dominant Form of Human Capital*	*Effect on Education Wage Gap*	*Effect on Gender Wage Gap*
United States	School	General	Positive (widening)	Negative (narrowing)
Germany	School plus firm	General plus occupation-specific	Negative (narrowing)	Positive (widening), through occupational sex segregation
Japan	School plus firm	General plus firm-specific	Negative (narrowing)	Positive (widening), through firm-internal labor markets

least portable among general, occupational, and firm-specific skills.

It can be hypothesized that human capital development systems that involve employers as central actors in human capital investment decisions will tend to produce contradictory effects on educational wage inequality and gender wage inequality. Employer-directed training (as in Japan and Germany) will tend to ***narrow*** the wage differential between high- and low-skilled workers compared to the differential produced under human capital development systems where workers receive most of their training in the educational system (the United States). Conversely, employer-directed training will tend to ***widen*** the wage differential between men and women compared to what it would be in a system where educational credentials have greater importance than employer-based training. This is because a human capital development system in which employers are important actors will have a wage determination process that tends to disadvantage women and recruitment patterns that also tend to distinguish between male and female applicants either through selection into internal labor markets (Japan) or through sex-stereotyping in occupational training (Germany). Based on this, we would predict that the United States, Germany, and Japan are on a continuum in terms of the education wage gap, with the United States an extreme case of a large education or skill differential and Germany and Japan as cases that have much smaller wage differentials based on skill. In contrast, Japan will be the outlier in demonstrating severe gender wage inequality, with Germany and the United States exhibiting less. These predictions are included in table 2.

Table 3 shows the concomitant recruitment patterns that go along with the dominant type of skill development in each economy. The lack of employer involvement in training is connected in the United States to a highly unstructured recruitment process, with personal connections being the most common job search method.[17] I postulate that the absence of systematic recruitment processes, particularly from school to work, is highly disadvantageous to less-educated workers and contributes to the discrepancy in wages between those workers and their highly educated counterparts. The gender effects are neutral to the extent that women are in networks that facilitate their job search (Petersen, Saporta, and Seidel 2000).

The United States: General Human Capital

The United States stands out in its marked lack of a systematic approach to workforce training. As

TABLE 3. Recruitment Mechanisms and Inequality

Country	*Dominant Recruitment Mechanisms*	*Effect on Education Wage Gap*	*Effect on Gender Wage Gap*
United States	Personal networks	Positive (widening)	Neutral
Germany	School-firm partnerships (through apprenticeships)	Negative (narrowing)	Positive (widening)
Japan	School-firm implicit recruitment contracts	Negative (narrowing)	Positive (widening)

stated starkly by Crouch, Finegold, and Sako, "The most obvious characteristic of skill creation in the USA is the absence of any generalizable system. . . . Indeed, the very concept of the improvement of workforce skills as a national project is difficult to envisage in the USA, where it is not clear that there can be national projects for what are essentially seen as matters for individual persons and individual companies, with possibly some contribution from local or state governments" (1999, 205).

The main locus of human capital development in the United States is the school, and the majority of American students receive general as opposed to vocationally specific training through the high school level. The United States made an early commitment to mass secondary education and, to a considerable degree, higher education as well. It led the rest of the world in the extension of secondary school education to "ordinary citizens" in the first half of the twentieth century, in contrast to most European countries, where secondary education was reserved for those who would continue on to college (Goldin and Katz 2001). Between 1900 and 1960 the rate of high school enrollment in the United States increased from just over 10 percent to nearly 90 percent, and the graduation rate increased from about 7 percent to 70 percent (Goldin 1999).

Analysts of American educational expansion have emphasized its "demand-driven" character (Walters 2000). Educational consumers in the United States could influence the supply of schooling in part because there were thousands of fiscally independent school districts that could make their own decisions about school funding, in contrast to the centralized fiscal situation in many European countries (Goldin and Katz 2001). The extension of the vote was also very important, as it gave citizens the ability to pressure the state to provide educational opportunities (Walters 2000).[18]

Compared to Germany and Japan, American employers' role in shaping how schools interfaced with the economy was minor and continues to be so. Unlike the situation in Germany, where collective bodies establish the guidelines for occupational skills, employer associations in the United States have historically been weak and have not assumed the role of helping to organize training and certification programs or set skill requirements for different jobs (Freeman 1994; Kerckhoff and Bell 1998). Geographical mobility, extensive employment opportunities for apprentices, and relatively weak unions have all been cited as reasons why apprenticeship training did not flourish in the United States (Lynch 1993).

The imparting of general skills at the secondary school level in the United States carries over to four-year bachelor's programs (Mortimer and Krüger 2000). American youth who pursue postbaccalaureate professional degrees enter the labor market with a much greater degree of occupation-specific preparation than their counterparts who leave school at the university or secondary level, but this currently accounts for less than 8 percent of the population of 30–34-year-olds (National Center for Education Statistics 2002).[19]

In sum, human capital development in the United States is marked by the development of general skills through high school and to a great extent through postsecondary institutions, and occupational (professional) development for the small minority of students who go on to postgraduate education in professional schools. A relatively undifferentiated curriculum leaves American employers with few signals to rely upon when they hire new graduates, save the quantity of education (number of years) a student has received and the presumed "quality" of that education, indexed especially in the case of university by the academic rank of the school (see for example Frank 1998).[20]

Given the emphasis on general skill acquisition and the American meritocratic ideology that anyone can go to college if he or she tries, vocational education courses have consistently been viewed as "second best" in American high schools. Shavit and Müller have pointed out that academic discussions of vocational education in the United States have rarely considered its possible role in keeping some high school or postsecondary graduates from ending up in the lowest-paying jobs; instead, debate has centered on the tracking function played by vocational education (Shavit and Müller 2000). Opponents of vocational education argue that lower-class students are overrepresented and that it therefore reinforces the intergenerational transmission of status, diverting these youth from postsecondary education and higher occupational attainment. But this begs the question of how vocational education graduates do in the labor market relative to their counterparts who do *not* proceed on to postsecondary education, namely those who complete secondary school and enter the labor market or those who drop out of school (Bishop 1989; Rosenbaum 1996).

Recent attempts to compare American high school and postsecondary graduates who have specific vocational training to their counterparts with

a general high school diploma, an associates' degree, or a bachelors' degree provide evidence that some types of vocational education are indeed valuable in the U.S. labor market, at least in graduates' early careers. Arum and Hout show that there are early positive occupational status and wage returns to those vocational high school programs in the United States with fairly specific content (1998). Females who follow a business or commercial curriculum in high school garner higher initial wages and status than their counterparts who enter the labor market with a general high school education. Likewise, some vocational programs lead to a first job with higher occupational status for both men and women than the general high school track. These results lead Arum and Hout to conclude that despite the importance of higher education in the United States for entry into white-collar jobs, "A differentiated vocational high-school curriculum, however, affects occupational outcomes for those that have not been singled out as the most likely candidates for the mental labours of the upper white-collar stratum. . . . To the extent that this curriculum specializes in areas that are valued by employers, these programmes provide an alternative route to higher wages" (1998, 507–8).[21] These findings are complemented by Kerckhoff and Bell's research on the value of specific credentials obtained in postsecondary education (1996).

Employer-Provided Training in the United States

Once American students leave school, through what means do they receive further training? A substantial proportion of youth cycle in and out of the labor force and school during the first 10 years of their worklife, thereby seeking additional skills from formal educational institutions even after they have entered their first full-time job (Arum and Hout 1998). Systematic evidence on the incidence of employer-based training in the United States is sparse (Knoke and Kalleberg 1994), but OECD estimates indicate that formal workplace training is considerably less prevalent in the United States than in Japan and a number of European countries. In their work on this issue, Acemoglu and Pischke cite OECD figures indicating that formal employer-provided training is provided to 72 percent of young workers in Germany and 67 percent of new hires in Japan, whereas 10 percent of U.S. workers receive formal training over the course of their first seven years in the labor market (Acemoglu and Pischke 1999, 542).[22] Lynch also points out that most employer-provided formal training in the United States is given to college graduates, especially those employed in the finance, insurance, and real estate industries. The recipients of employer-based training are concentrated in professional, technical, and managerial jobs (Lynch 1992a, 1992b). American employers are sometimes criticized for investing little in either the recruitment or training of non–college graduates in particular, and very few large American corporations hire new high school graduates into jobs with career potential (Rosenbaum 2001).

Implications for the Education Wage Gap

How might the institutional division of labor for human capital development in the United States be related to the large wage gap between low- and high-skilled workers? The United States began the 1980s with a larger skill wage gap than most industrial countries. Freeman and Katz (1995) report a figure of 1.23 for the log of the ratio of wages received by workers in the top decile versus those in the bottom decile (the 90-10 ratio), compared to figures of just 0.78 in Germany and 0.95 in Japan. In the ensuing decade the United States and United Kingdom experienced the greatest increases in wage inequality, with the U.S. figure rising to 1.40 by 1990. Meanwhile, Germany experienced no noticeable change in wage differentials, and the wage gap in Japan increased only slightly.

Are these patterns linked to institutional arrangements, particularly the division of labor between schools and workplaces for human capital development and the presence or absence of school-work mechanisms, especially for the less educated (high school graduates)? The most marked aspect of the skill wage gap in the United States is that it is particularly large at the *bottom* of the wage distribution; the 50-10 wage gap (ratio of workers' wages in the fiftieth percentile of the distribution relative to workers in the tenth percentile) is nearly twice as large as in other countries, whereas the 90-50 gap is only slightly larger in the United States. Blau and Kahn calculate that about 40 percent of the difference in the 50-10 differential between the United States and other countries is attributable to productivity-related worker characteristics (Blau and Kahn 2002). This is *before* international differences in wage-setting institutions are taken into consideration.

This raises the question of whether institutional explanations of the education wage gap across countries should rest so heavily on wage compression via institutionalized wage-setting, the overriding explanation offered by political scientists and

labor economists. In a recent comparison of the wage distribution in Germany and the United States, Freeman and Schettkat (2000) ask whether low-skilled workers are paid higher relative wages in Germany because they benefit from institutionalized wage-setting policies that raise the minimum wage level or because they are more skilled. This in essence is a contest between two competing explanations for the lower wage gap in Germany: wage compression or skill compression. They find that German workers do exhibit less variation in skill levels and that this supplements wage-setting institutions in the explanation of the concentration in the earnings distribution.[23] This supports my assertion here that it is important to consider not just wage-bargaining institutions, but also how the skill development system affects the wage distribution across workers. Estevez-Abe, Iversen, and Soskice (2001) provide an illuminating counterpoint in their demonstration that almost 70 percent of the variation in earnings inequality across 17 OECD countries can be explained by the form of countries' wage-bargaining and skill systems taken together.

It seems clear that the absence of a national system of occupational training in the United States or of a systematic way of matching new graduates with employers poses the greatest disadvantage to the least educated. American youth are on their own in developing and demonstrating occupational proclivities in their early jobs, and this experience results in labor market "floundering" for considerable numbers of youth during their early twenties. The disorderliness of the United States school-work transition has set off a lively debate in sociology and economics as to whether early full-time but transitory job experiences are a waste of time or, on the other hand, contribute to long-term human capital development and an upward earnings trajectory; a similar debate surrounds the issue of youth working part-time while in school (Gardecki and Neumark 1997; Mortimer and Krüger 2000; Neumark 1998; Ruhm 1995). Some who criticize the absence of a systematic school-work transition in the United States also claim that it results in an overall loss in aggregate human capital, as workers in their early twenties who could be receiving systematic training are instead wandering around in the labor market trying to find their place (Hamilton 1990).

The lack of regularized communication between businesses and high schools in the United States is also important because it means that employers do not directly communicate to students what types of skills are required on the job. A considerable body of evidence suggests that American employers do not base their hiring decisions on students' performance in school (Bishop 1989; Rosenbaum 2001; Rosenbaum and Kariya 1991). In an extensive school-work research agenda, Rosenbaum in particular has argued that this makes it very difficult for American high school students to see the connection between school performance and their future worklife (Rosenbaum 1990, 1996, 2001; Rosenbaum and Kariya 1989).

In sum, the large wage gap by education in the United States seems highly consistent with the features of the American human capital development system: an emphasis in the educational system on general skill development for all, a corresponding employer emphasis on quantity of education (in the absence of signals by which to differentiate applicants' occupational proclivities), a comparatively low rate of employer-based training (especially for less-skilled workers), and a disorderly school-work trajectory with no institutionalized job-matching mechanisms for less-skilled workers.

Implications for the Gender Wage Gap

The implications of the type of human capital development system exhibited by the United States may be quite different for gender wage inequality than for education wage inequality. Given that so much human capital investment is based on individual initiative, that training is non–occupationally specific, and that the educational system is structured in such a way that individuals can leave the workforce and return for advanced schooling or professional degrees, Americans arguably face a relatively flexible institutional environment. When the site of human capital development is instead primarily the school-employer nexus, as in the German occupational training system, or the firm, as in the Japanese firm-based training system, preexisting gender inequalities may be more easily reproduced. The mechanisms are different in the case of occupational skill-based systems (Germany) versus firm-specific skill-based systems (Japan), but the implications for gender inequality may be quite similar.

As with the education wage gap, one can choose either to analyze the static cross-country differentials in the gender wage gap or the trajectory of change over time. In static terms, the United States does not exhibit one of the lowest gender wage gaps among industrial nations (Blau and Kahn 1996b, 2002). Blau and Kahn (1996b) argue that the lower gender wage gaps in a number of Euro-

pean countries are associated with compressed wage structures. This suggests a positive relationship between the gender wage gap and the skill wage gap, which is opposite to the prediction I suggested earlier. Their logic is based on the fact that women tend to be disproportionately concentrated in low-paying jobs; raising the wage floor therefore should especially benefit women. While this is theoretically appealing, it does not necessarily hold across countries. When adjustments are made for the effect of wage structure, the gender wage gap does decline in the United States and the United Kingdom, the two countries with the most unequal wage distribution across skill levels. But it *increases* in a number of other countries including the Netherlands and Austria, and remains nearly the same in Germany (OECD 2002).[24]

It is important to note that Blau and Kahn focus on the presence of collective bargaining agreements as the institutional reason for a compressed wage structure; these raise wages at the bottom of the distribution for union workers and sometimes extend to nonunion workers as well. But as I have discussed in this chapter, a human capital development system that is more oriented to imparting skills to less-educated workers may be another institutional mechanism influencing lower wage inequality. Therefore, it is worth exploring how the *sources* of wage compression affect gender inequality.

If one source of this compression is employer-organized training, this may exacerbate rather than lessen gender wage inequality. There are two principal mechanisms through which this may occur: vocational training that tends to reproduce existing occupational sex-stereotyping (the German case), and firm-specific training that employers tend to reserve for men, in the expectation that women have less continuous work histories and less commitment to the firm (the Japanese case). In the latter instance, female workers may experience considerable discouragement as they observe that more on-the-job training is given to men, and this may prompt married women to exit the labor force in higher numbers than they would otherwise (Ogasawara 1998).[25] Even in the United States, where rates of employer-provided formal training are much lower than in Japan, women are significantly less likely to receive such training or to participate in apprenticeships. When they are provided company-based training, the duration is considerably shorter than the training periods for men (Altonji and Spletzer 1992; Barron, Black, and Loewenstein 1987; Lynch 1993).

In terms of the cross-sectional gender wage gap, the distinction among the United States, Germany, and Japan is clearest between the first two countries and Japan. The female-male median weekly earnings ratio for full-time workers in Japan in the late 1990s was just 63.6 percent; the comparable figures in the United States and Germany were 76.3 percent and 75.5 percent respectively (Blau and Kahn 2002).

The issue of selectivity into the labor force is of course very substantial in the case of women, and has important implications for the wage gap. There is not enough space to discuss this here, but it bears noting that American women demonstrate very different work patterns by marital and childbearing status than women in Germany and Japan. The proportion of women who exit the labor force at the time of childbirth is lowest in the United States (16 percent), compared to 25 percent in Germany (OECD 2002) and an astounding 75 percent in Japan, a figure that has not changed in the past two decades (Japan Institute of Labour 2003). An additional 21 percent of working women in Germany reduce their working hours upon the birth of a child, compared to 10 percent of American working women (OECD 2002). Overall, German and Japanese working women are much more likely to participate in the labor force part-time than American women. Nineteen percent of American female labor force participants are part-time workers, compared to 34 percent of German women and 39 percent of Japanese women (OECD 2002, table 2.1).

But the most striking feature of the gender pay gap in the United States is that it declined dramatically in the past 20 years after having been relatively stable for most of the twentieth century. This decline outpaced that in other OECD countries by a wide margin. The United States showed a percentage change of 22 between 1979 and 1998, compared to a figure of 8 percent for Japan and 5 percent for Germany over the same period (Blau and Kahn 2002).

Blau and Kahn argue that the narrowed U.S. gap indicates that American women have been "swimming upstream" against the simultaneous widening of the wage gap by skill over the same period (1997). In a decomposition of the narrowed gender wage gap in the 1980s, they show that increases in full-time labor force experience and changes in occupational affiliation accounted for about three-quarters of the increase in women's relative wages, followed by a small boost from women's increased educational attainment. They argue that it is fortunate that women did experi-

ence increases in human capital and changes in their occupational locations, as the rewards to skill were increasing at the same time and women would have been increasingly left behind had they not been able to make these gains (1997, forthcoming).

Although American women's years of education did not increase dramatically during this period, their chosen fields of study demonstrated significant change. Gender segregation in field of study at college dropped dramatically between 1965 and 1985 and continued to decline in the late 1980s. There was also a decline in segregation by field for master's degrees in the 1980s (Jacobs 1995). Women's participation in professional degree programs such as law, business, and medicine also increased substantially, affording them credentials that were largely portable across employers.

American women's wage gains since 1970 coincided with the first major decline in occupational sex segregation in the twentieth century (England and Folbre, chapter 27 in this handbook; Jacobs 1989). The fact that changes in occupational affiliation and workforce experience account for so much of the narrowed gender pay gap may be related to women's increased entry into previously male-dominated majors and into professional schools. In this regard it is well worth considering how the shape of the human capital development system in the United States and the permeability of the boundaries of training systems (generally located in the educational system) may have sped women's wage progress. In short, women in particular may benefit from systems that in principle allow people to return to school to obtain educational credentials—particularly professional degrees—that employers value, in contrast to systems where there are strong age barriers to training. As I show below, Japan provides a strong contrast to the United States. Japanese universities have traditionally had age barriers to entry. Moreover, there has been no institutional equivalent to American law schools, and attempts to create business schools in Japan have met with mixed success.

Human Capital Development in Germany: General and Occupationally Specific

Germany and the "modified apprenticeship countries" (Austria, Denmark, Germany, Luxembourg, and Switzerland) represent a radical departure from the tendency of the American educational system to produce individuals with high levels of general human capital and little occupation-specific capital. Following four years of primary school, students are tracked into lower secondary school (*Hauptschule*), middle secondary school (*Realschule*), or upper secondary school (*Gymnasium*). All of these constitute general studies, but students who continue their education after *Hauptschule* or *Realschule* participate in Germany's famed "dual system" that combines part-time vocational school and apprenticeship with an employer (Blossfeld 1993; Mortimer and Krüger 2000; Witte and Kalleberg 1995). The certificates awarded upon completion of vocational training correspond to about 400 officially recognized occupations, the majority of which require apprenticeship experience.

In an international comparison of the types of training youth receive, Crouch, Finegold, and Sako (1999) report that nearly 80 percent of German secondary school students compared to just over 25 percent of Japanese students were enrolled in vocational or technical education rather than general education. (It is not possible to calculate an exactly comparable figure for the United States, since many students take a few vocational courses in the process of obtaining their general high school diploma.) Of the 80 percent in Germany, more than two-thirds of students were in the dual system, and the remainder participated in school-based vocational training. Not surprisingly, Germany ranked first in providing qualifications to 18-year-olds and the United States and Japan ranked at the bottom. (A distinct minority of Japanese students choose the vocational high school track.) Conversely, the United States and Japan ranked first and third respectively in the proportions of 18-year-olds who had access to general as opposed to vocational higher education, and Germany ranked twelfth out of the 14 countries in the study.

The German dual system stems from a very different history of employer involvement in education than in either the United States or Japan. Thelen and Kume provide a comparative view of how training systems developed in Germany and Japan (1999). In the early industrial period, the German government instituted policies that allowed the highly organized and progressive artisanal sector to coordinate skill formation and certification. Unions later joined to maintain the quality rather than the supply of skills, unlike in Britain. The result was a collective solution to the problem of training skilled laborers. Individual employers benefited from providing apprenticeships and paying low wages during the training period, and since workers' skills were occupationally rather than firm-specific, employers also benefited from being able to hire experienced workers from other firms.

The contrast is great between the American system of general (and, for a minority of youth, professional) human capital development and the German system that combines general and occupation-specific human capital development for a majority of youth. Although German firms provide training, it is unusual for workers to go beyond the occupational level for which formal education qualifies them (Mortimer and Krüger 2000). Moreover, the high level of standardization in apprenticeship programs and the existence of national certification for occupational skills means that employers recognize the credentials workers have obtained while working as apprentices for other firms (Witte and Kalleberg 1995). Credentials are, in short, portable.

Consistent with Maurice, Sellier, and Silvestre's argument about "qualification space" in Germany, Blossfeld and Mayer found in their research on job mobility that only 16 percent of all job transitions "are mediated through the institutional structure of an internal labor market" (1988, 138). Hannan, Schömann, and Blossfeld (1990) found German labor markets to correspond poorly to sociological labor market theorists' textbook version of a privileged primary sector characterized by internal labor markets where workers experience wage growth versus a secondary sector characterized by wage stagnation. As they reported, "Male and female workers in sectors that can reasonably be characterized as having internal labor markets did not experience higher than average wage growth within jobs. This challenges the core assumption of theories of labor market segmentation. . . . There are many important differences in employment relations between the FRG [Federal Republic of Germany] and the U.S. over the period studied. Perhaps theories of labor market segmentation have implicitly assumed structures that are unique to the U.S. and that do not hold in other industrialized, capitalist economies" (1990, 709–10). Moreover, Hannan and colleagues found no statistically significant relation between men's and women's first-job earnings and either firm size or job skill level.

The school-work transition for the approximately 70 percent of youth who do apprenticeships is also markedly different from the transition to work for American non–college graduates. In contrast to the radical disconnect American youth often perceive between what happens in school and in one's later worklife, German youth are purportedly motivated to achieve in school in order to enter a desirable apprenticeship (Lynch 1993; Mortimer and Krüger 2000).

Implications for the Education Wage Gap

Wage differentials by level of education in Germany are consistently reported to be much lower than in the United States. The difference is especially marked in the lower half of the income distribution; the 50-10 wage differential in Germany is less than half that in the United States (Blau and Kahn 1996a). In a comparison of the wage determination process in 13 European countries, the wage penalty for completing less than upper secondary education was low in Germany relative to other countries (OECD 2002).

In terms of change across time in the skill wage gap, Hannan et al. found that the relative advantage of higher education for first-job earnings declined sharply for both men and women between cohorts who entered the labor market between 1950 and 1975 (1990). Acemoglu (2002) and Freeman and Katz (1995) also report that in contrast to the United States, the wage gap by skill remained relatively stable in Germany over the past 15 years.

Implications for the Gender Wage Gap

The traditional sociological focus on occupations rather than wages, contrary to labor economics, has led researchers to describe the German employment relations system in occupational closure terms. The institution of apprenticeship sets up entry barriers to occupations, whereas promotion into skilled positions in the United States is based more on general educational credentials and on work experience in a specific enterprise (Haller et al. 1985). It is intriguing to surmise that occupational closure may have contradictory effects on the skill wage gap and the gender wage gap, helping to maintain a relatively low gap in the former case and a wider one in the latter. As discussed in the preceding section on the United States, the gender wage gap is no smaller in Germany than the United States, and the rate of labor force participation among married women is considerably lower in Germany, demonstrating less overall labor force attachment on the part of women. The "occupational space" of Germany, operating through the mechanism of occupational closure, may lead to the maintenance of a sizable wage gap through occupational sex segregation. I will discuss below the radical difference between this mechanism and those in the human capital environment of Japan, where the male-female wage gap is even larger.

Witte and Kalleberg report extreme sex segregation in the most common 16 apprenticeship fields in Germany (1995). In five of the 16 areas, women comprised over 70 percent of all apprentices, and in another seven areas, women comprised less than 10 percent. This presages a relatively high degree of occupational sex segregation in the labor force (Anker 1998; Blossfeld 1987; Witte and Kalleberg 1995). Similarly, Hannan, Schömann, and Blossfeld suggest that occupational sex segregation seems to account for more of the difference in German men's and women's wages than differences in the amount of education per se; women's concentration in the professional service sector (including health and education) in particular disadvantages them in wage terms (1990). As mentioned earlier, they found virtually no support for the idea that firm-internal labor markets are crucial for wage determination in Germany and that women's exclusion from such markets is a mechanism contributing to the gender wage gap. In contrast to the United States, there is little evidence that occupational sex segregation has declined in recent years in Germany (OECD 2002).

Human Capital Development in Japan: General and Firm-Specific

Japan has a markedly different type of human capital development system than either the United States or Germany, and a radically different institutional configuration governing the school-work transition as well. If Germany represents the quintessential "occupational space," then Japan on the other hand represents the quintessential "organizational space."[26] Japanese high school and university graduates typically construct their goals not in terms of the occupation in which they wish to be employed but in terms of the company for which they wish to work. The fixation on workplace rather than occupation arose out of historical circumstances that gave pride of place to the firm rather than to the occupation as a central determinant of workers' identity as well as work rewards. Central to this phenomenon is the way that Japanese employers shaped the wage determination process during industrialization; this privileged job tenure is an important basis for compensation. The strategies of Japanese employers were related to the qualifications of labor supplied by the nascent national educational system and to the role of the state in shaping employer-employee relations.

Research on the origins of the Japanese employment system is extensive. Following Abegglen's assertion that the postwar Japanese employment system could be traced to "traditional" employment practices of the nineteenth century (1958), the origins of the system during and after the World War I period became an object of debate in the 1960s and 1970s among Japanese scholars and foreign specialists on Japanese economy and society. The debate was polarized between scholars who, following Abegglen, argued for the historical-cultural roots of Japanese manufacturing firms' stress on "lifetime employment," seniority wages, and a pseudofamilial work atmosphere, and those scholars who claimed that the origins of the Japanese employment system could be traced almost entirely to reasons of economic efficiency (cf. Taira 1962; Sumiya 1966). Cole (1971) summarized these viewpoints nicely, situating the development of the permanent employment system in the context of employers' skillful deployment of traditional cultural symbols in their attempt to bind skilled workers to the firm. He draws attention to the full constellation of social actors involved in the creation of the employment system and to the historically based power relations among them, stressing the centrality of employers in the fashioning of what was to become the prototypical Japanese employment relationship.

Cole's early article viewed Japan through a comparative lens with Germany, and this has been followed in more recent work by Thelen and Kume on the historical origins of training systems. They characterize skill formation regimes based on "solidarism" among employers versus "segmentalism,"[27] and point out that "the very different interaction between the state, artisans, industry, and labor pushed Japan towards a 'segmentalist' rather than 'solidaristic' approach to skill formation" (1999, 51) Literacy rates in Japan at the beginning of the twentieth century were very high by international standards, but the technical skills needed in the country's emerging heavy industries were not well represented in the human capital stock of artisans. Unlike Germany, the Japanese government of the late nineteenth century chose not to encourage the modernization of the artisan sector through means such as the standardization of apprenticeships. Facing a shortage of skilled labor, employers in the early twentieth century of necessity were in the position of having to train new recruits and then attempt to keep them from being bid away by competing firms. This spurred the development of training and compensation systems

that were the early seeds of Japan's so-called "permanent employment system." As Crawcour notes:

> With unskilled labor and the raw material for skilled labor—that is to say, school and college leavers—in abundant supply, the strategy of employing only young unskilled workers and internalizing training within the firm could produce a situation in which the supply of skilled labor could be controlled by the employment and training policies of the firm itself. The evolution of the main features of the Japanese employment system—wages related to length of service, lifetime employment, welfare based on employment and suppression of organized labor except for purposes of harmony within the firm as a community—can be understood largely as the process by which employers sought to bring this situation about. . . . The key innovation was a system of wages under which payments were related to length of service to the firm rather than to skill. (1978, 233–34)

Japanese firms' competition for workers and their collective strategies to dampen such competition are a good example of the "search-induced monopsony" analyzed by Acemoglu and Pischke (1999): In an environment where it is costly for a worker to change employers, the firm has a degree of monopsony power and can capture part of the output from the worker's higher productivity. The costs workers face in trying to change employers are the risk of unemployment and the risk that they will not experience a wage increase by moving to a new employer. In these situations (especially when exit rates from unemployment are low), there may be more firm-sponsored formal training programs. While Acemoglu and Pischke's analysis does not refer to historical examples, it is an apt characterization of the evolution of the interwoven institutions in prewar Japan that later came to be known as the distinctive Japanese employment system.

In the aftermath of World War II the impetus for Japanese firms to extend implicit promises of stable employment to workers came more strongly from workers themselves. Employment stability was a major demand of postwar labor unions, and internal labor markets became the normative employment model for firms large enough to develop them. On-the-job training is prevalent in Japanese firms. Consistent with Acemoglu and Pischke's analytical framework linking employer-provided training to workers' risks of not being able to become re-employed once they enter unemployment, the monthly exit rate from unemployment in Japan is half that in the United States (22 vs. 48 percent; Acemoglu and Pischke 1999).

Japanese employers' pattern of recruiting workers with general human capital directly from school has continued throughout the postindustrial period in surprisingly robust form. The Japanese educational system prior to World War II was relatively stratified and bore a greater resemblance to European systems than to the American. Compulsory education ran for six years, after which students were separated into tracks; only a small minority of students eventually attended university. The post–World War II reforms undertaken by the U.S. occupation simplified the system along the "6-3-3" American model, making six years of primary education and three years of junior high school compulsory for all students (Rohlen 1983). This system has remained in place for the past 50 years, although secondary schooling has nearly assumed the status of de facto compulsory education, with more than 90 percent of Japanese students completing it (a rate that exceeds that of the United States).

Significant stratification occurs at two points in Japanese students' careers: during ninth grade and during the senior year in high school. Ninth-grade students take practice high school entrance exams and receive intensive in-school counseling regarding which high school in their district to apply to (LeTendre 1996). Public high schools, attended by the majority of students, are finely ranked according to the minimum admissible score on regional standardized tests given to ninth graders. Students who do not score highly on practice exams end up in one of the lowest-ranked general high schools in their school district (Brinton 1998). A vocational education alternative also exists for students who are unlikely to make it into a highly ranked high school—every prefecture has several public vocational high schools, most of which offer either industrial or commercial training.[28] The second sorting point in Japanese students' educational trajectories occurs at the completion of high school. A minority of graduates enter the labor force; most aim instead for some form of postsecondary education. Chief among the latter are four-year universities and two-year junior colleges.[29] A third alternative, *senmon gakkô* (specialized two-year training schools), saw considerable growth in the past 20 years and has become a popular postsecondary alternative for those students who want further education but cannot pass the entrance exam for a reasonably prestigious university or junior college (Slater 2002). The content of the vocational training offered by *senmon gakkô* is not regulated by the gov-

ernment, and its utility is highly variable across schools.

The Japanese educational system bears considerable surface similarity to the American. Both countries have an educational system with a 6-3-3 structure, a societal norm of high school attendance, a preponderance of students who graduate from high school with general rather than occupationally specific human capital, and a relatively high proportion of students who receive postsecondary education (between 50 and 60 percent in each country), again of a highly general rather than vocationally specific nature. Compared to the German and American educational systems, Japan stands closer to the German in terms of instructional standardization, in-between the German and American in terms of the degree to which students are stratified across curricula as they move through the system, and much more similar to the American in terms of the lack of vocational specificity in education.

But despite considerable surface similarity between the American and Japanese educational systems, the interface between the educational system and the workplace is very different in Japan in two ways: (1) the institutionalized nature of the school-work transition process, (2) the extent to which educational training continues in the workplace, as implemented by individual employers. These, I argue, have significant ramifications for the skill wage gap and the gender wage gap.

Implications for the Education Wage Gap

Unlike the United States and similar to Germany, the Japanese transition from school to work is a very discrete process.[30] The orderly sequencing from full-time education to full-time labor force participation has undergone change along with the turbulence of the Japanese economy since the early 1990s, and it is possible that the diversification of early life course transitions will evidence itself in Japanese data on very recent cohorts. But this would break from the strong normative sequencing apparent in the experiences of prior cohorts.[31]

University graduates move into work organizations through networks that are more university-based and less personalistic than in the United States. The linkages between prestigious Japanese universities and large firms bear some resemblance to those between professional schools and firms in the United States, such as the recruiting relationships between prestigious business and law schools and high-profile firms (Brinton and Kariya 1998). At the high school level, schools and employers are linked together not through apprenticeship arrangements as in the German case but rather through the legal encouragement of recruitment relationships resembling implicit contracts (Brinton 2000; Rosenbaum and Kariya 1989). Japanese high school graduates' entry into the labor market is effected largely through employers' direct contact with the schools from which they wish to recruit, followed by schools' recommendation of one student per job opening. Prior to the onset of serious economic recession in 1992, the system of matching high school graduates to jobs appears to have resulted in little of the labor market "floundering" experienced by many high school graduates in the United States (Genda and Kurosawa 2001; Rosenbaum and Kariya 1989; Ryan 2001).

Japanese high school graduates fortunate enough to have attended a high school with many employer contacts are likely to be able to enter a company that puts them on a track parallel to university graduates (viz. white-collar workers) in terms of the provision of on-the-job training, seniority wages, and job security (Dore and Sako 1998). If German labor markets correspond poorly to the specifications of segmented labor market theory as developed in the United States, Japan corresponds very well. Wages are closely related to firm size and to progression through firm-internal labor markets in large firms (Brown et al. 1997; Kalleberg and Lincoln 1988; Spilerman and Ishida 1996). Occupational category is a poor predictor of both workers' self-identification and their market rewards. In studying earnings inequality in American and Japanese manufacturing firms, Kalleberg and Lincoln stated starkly, "We have clear and consistent evidence that attributes of jobs play a greater role in the determination of earnings in our American than in our Japanese sample" (1988, S142).

Firm-internal labor markets and the so-called permanent employment system developed first in heavy industries, and from the beginning involved male manufacturing workers. The later development of firm-based unions meant that full-time blue- and white-collar employees negotiated wage increases together. Koike has aptly described the similarity of age-earnings trajectories between male white-collar and blue-collar workers in Japan as "the white-collarization of blue-collar workers" in large firms, and has demonstrated the similarity between the age-wage profile for male blue-collar workers in such firms in Japan and white-collar workers in a number of European countries (Koike 1994; Koike and Inoki 1990). The education or

skill wage gap is considerably smaller in Japan than in the United States (Brown et al. 1997; Freeman and Katz 1995; Ishida 1993; Katz and Ravenga 1989; Koike 1994; Nakata and Mosk 1987; Spilerman and Ishida 1996). Furthermore, the gap between high school graduates' lifetime earnings and those of university graduates *declined* in the 1960–80 period and rose very slightly in the 1980s (Nakata and Mosk 1987), while the gap in the United States rose sharply.

Implications for the Gender Wage Gap

Japan exhibits perhaps the clearest case of how compensation systems rooted in firm-internal labor markets disadvantage women. I have written extensively on this elsewhere (1993, 2001) and so will only briefly summarize the arguments here.

In comparisons of wage determination across countries, researchers have consistently found that a high premium is attached to job tenure in Japan (Brown et al. 1997; Hashimoto and Raisian 1985; Kalleberg and Lincoln 1988; Spilerman and Ishida 1996). Cross-sectional data on male employees' average length of stay in a firm verify that Japanese men tend to exhibit longer spells with one employer than men in Germany or the United States. The respective figures are 11.3, 9.7, and 7.4. years. Likewise, the proportion of male employees who have spent less than one year in their current firm is over three times as high in the United States (26 percent) as in Japan (7.6 percent). The corresponding figure in Germany stands in between, at 16.1 percent (Crouch, Finegold, and Sako 1999).

Japanese employers' investment in on-the-job training and their commitment to seniority wages is heavily skewed toward male workers. Women are as likely as men to enter large firms upon graduation, but they are much less likely to receive on-the-job training (Brinton 1989, 1991, 1993). Across the life cycle, Japanese women are much more likely than men to move into the classic "secondary" small-firm sector of the economy (Brinton 1989; Brinton, Ngo, and Shibuya 1991). Employers' practice of prodding women to quit the firm upon marriage, often with the enticement of a "retirement payment," has been formally illegal since the enactment of an Equal Opportunity Employment Law in 1986. But the practice persists. This reinforces a vicious cycle wherein employers assume that women have low work commitment and accordingly place them in dead-end jobs outside of internal labor markets. When many women subsequently exit these dead-end jobs upon marriage or childbirth, employers' self-fulfilling prophecy is realized. Large companies' creation of a dual-track system for women in the late 1980s, consisting of the conventional dead-end track and a management track, has largely backfired since the Japanese economy went into recession in the early 1990s: many young women choose the dead-end track in hopes of increasing their chances to get hired at all. The Japan Institute of Labour recently reported that just 2 percent of all management positions in large firms are held by women (Ministry of Health, Labour, and Welfare 2001).

In sum, Japan represents a dramatic counterpoint to the United States in its human capital development system and inequality patterns. General human capital development through educational institutions is heavily complemented by on-the-job training for those workers in whom employers choose to invest. The recipients of on-the-job training and internal labor market placement are not nearly as differentiated by skill level as in the United States, and have entered the workplace through a process that is highly coordinated between schools and firms. The beneficiaries of this human capital development system are strongly differentiated by gender rather than prior education or skill level. Men are heavily privileged because employers perceive that they can more safely assume that men's length of service (and hence the employers' own returns to productivity-enhancing skill investments) will be substantial. The result of this form of human capital development system is a narrow skill wage gap and a wide gender wage gap.

Conclusion: The Comparative-Institutional Analysis of Education-Economy Linkages and Economic Inequality

In this chapter I have argued for the idea that economic sociologists could profitably set as one of their research agendas the theoretical articulation of how education-economy linkages structure and reproduce patterns of inequality across postindustrial societies. I have conceptualized two education-economy linkages as theoretically fruitful to examine: the division of labor between schools and firms for individuals' human capital development, and the recruitment mechanisms structuring individuals' movement out of school and into the workplace as well as those structuring movement across jobs. Economic sociologists have based much of their claim to originality on the careful analysis of how institutional arrangements form the context within which individual economic behaviors take place. Given these strengths, the extension of eco-

nomic sociological inquiry into the study of comparative inequality regimes based on varied education-economy linkages would seem very promising.

Much of the theoretical and empirical work to date on the relationship between institutional arrangements and inequality patterns across industrial societies has been done outside of sociology. The neighboring disciplines of political science and labor economics have focused considerable attention on cross-national variation in wage compression across skill boundaries. In closing I would suggest that economic sociologists can profitably draw on the extensive empirical work by labor economists and the theoretical exploration of wage-setting arrangements by both labor economists and proponents of the varieties of capitalism approach. Building upon the theoretical formulations of educational and stratification researchers, economic sociologists can fashion a comparative research agenda designed to further specify how skill and gender wage gaps are influenced by the varied institutional arrangements of capitalism. Many of these institutional arrangements stand precisely at the intersection of education and the economy.

Notes

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1. For exceptions in sociology, see Chang 2000; Rosenfeld and Kalleberg 1990; and Wright, Baxter, and Birkelund 1995.

2. See Brinton 1988, 1993 for a related discussion, relevant to gender inequality.

3. See Brinton and Kariya 1998 for a consideration of the social embeddedness of recruitment processes.

4. Also see Dobbin's chapter 2 in this handbook for a review of comparative-historical studies of management systems and industrial relations.

5. This is reified in the organization of sections in the American Sociological Association. The Education and the Organizations, Occupations, and Work sections are both relatively large in terms of membership and oddly, there is no Social Stratification section in the ASA that would bridge the spheres of education and work. The recent creation of a section on Labor and Labor Movements has drawn together scholars interested in labor politics and processes.

6. What then is the causal connection between the system of wage determination and the structure of the educational system? Müller and Shavit suggest that Maurice and colleagues' work shows that employers adapt their training and recruitment policies to the educational system. I would modify this by suggesting that the direction of the relationship may be historically contingent, dependent on the relative timing in any particular country of the development of the educational system on the one hand and employers' recruitment and training strategies on the other.

7. DiPrete and Soule (1988) found that women were less likely than men to be promoted from lower- to upper-tier jobs in the U.S. federal bureaucracy; several other studies looked at men's and women's promotions in internal labor markets in specific firms. Spilerman and Ishida (1996) excluded women from their study of career advancement in a large Japanese financial firm. Only 1 percent of managerial employees were women, whereas all of the clerical workers were female; there was no mobility between the clerical and managerial ranks.

8. See Brinton 1988, 1993, 2001 for a development of this line of argumentation.

9. Witness Freeman's statement in the introductory chapter of his *Working under Different Rules:* "In Economics I, the invisible hand of market forces sets wages, prices, and quantities, aided perhaps by a Wizard of Oz 'auctioneer' who calibrates prices and wages until all markets clear. In real labor markets, however, matters are more complicated and interesting. Every country has its own labor market institutions—unions, management, organizations, government agencies—and rules that help determine outcomes" (1994, 14–15).

10. But there is also sensitivity in the literature to the fact that strong unions and centralized wage-bargaining do not necessarily go hand in hand, making it necessary to consider them separately.

11. Increased international trade, varying across countries, has also been investigated as a source of differential change in the demand for skilled workers. See reviews in Acemoglu 2002 and in Katz and Autor 1999.

12. Acemoglu further points out that under this scenario, job creation would be less desirable and unemployment would increase across skill levels, and that this is consistent with European trends and with the contrast between the United States and continental Europe.

13. As Dobbin notes in his chapter in this handbook, an important issue for economic sociologists is to explain the diversity of economic systems that operate effectively. He notes, "The question of what kinds of economic behavior patterns are actually extinguished by their inefficiency is an important one, but it is remarkable how many different behavior patterns are not extinguished, or have not yet been" (Dobbin, xx).

14. Both political scientists and economists also consider poverty rates cross-nationally. This is beyond the scope of this chapter as I have formulated it. A considerable amount of empirical research has been done using the Luxembourg Income Study, although there are some important exceptions (such as Japan) in the coverage of the data sets (see Gottschalk and Smeeding 1997).

15. Issues of ethnic inequality are also embedded in analysis of the first type of inequality to the extent that significant educational differences persist across ethnic groups.

16. I originally intended to include social class reproduction as a third type of inequality that may be linked to national institutional variation in the education-economy linkage. However, the literature on social class reproduction is vast and involves a number of issues that go beyond the boundaries of a chapter on education and the economy. Of particular importance for intergenerational class inheritance, of course, is the issue of who gets educated. This is logically prior to the issue of how different amounts of education translate into labor market returns and how this process may differ by ascriptive characteristics (gender and ethnicity). It is this latter issue that I focus on here—how the translation of education into labor market rewards for different groups may depend in part on the institutional arrangements governing human capital development and recruitment.

17. As initiated by Granovetter's classic study (1995), the job search literature has consistently documented the important role played by social ties in American workers' job searches. More recent literature specifically on the school-work transition reiterates the finding that social ties are important at this stage as well, given the lack of formal institutions structuring the school-work process in the United States (Rosenbaum et al. 1990; Rosenbaum 2001).

18. It may be no accident that human capital theory, with its highly individualistic conception of how skill development takes place, had its birthplace in the United States. The lack of organized apprenticeship programs or systematic employer investments in training means that a great deal of human capital development occurs before individuals enter the workplace on a full-time basis. This leaves much decision-making control over human capital investments squarely in the hands of youth and their families. The degree of status transmission across generations is high in the United States; contrary to the implications of Turner's classic depiction of the United States as a "contest mobility" regime (1960), American intergenerational class inheritance is as high as in many other advanced industrial economies (Ishida 1993).

19. At the professional level, of course, professional associations have played a major role in the construction of certification standards (Abbott 1988).

20. At the secondary education level, Kirschenman and Neckerman show that many Chicago employers use the high school name or even the fact that the job applicant graduated from one of the city's public high schools as an indication that he or she is unqualified (1991).

21. In stating this, they suggest that there is a way in which vocational programs in secondary schools and non-university postsecondary educational institutions may *reduce* intergenerational status reproduction, as the students in these programs are disproportionately from disadvantaged backgrounds but reap the benefits of employer-valued educational training. This area will undoubtedly continue to be one of heated debate within the sociology of education.

22. Loewenstein and Spletzer report a higher figure for the proportion of new workers who receive informal training by U.S. employers (1999), but Acemoglu and Pischke (1999) note that even the higher figure is still only about one-half the figure for formal training by German and Japanese employers.

23. The widely cited *International Adult Literacy Survey* found American workers to be more concentrated in the extremes of the verbal and quantitative skill distributions than German workers, who were bunched in the middle (National Center for Education Statistics and Statistics Canada 1995; see also Freeman and Schettkat 2000). Unfortunately Japan was not included in the study. As is well known, international comparisons of students' performance in mathematics and science consistently rank Japan at or near the top of the distribution (National Center for Education Statistics 2002). It is principally the variance in the distribution with which we are concerned here; studies have reported low variance in the Japanese scores.

24. This is based on OECD statistics published in 2002. Blau and Kahn (1996b) report the same results for Germany and Austria; the Netherlands is not in their sample.

25. The Korean labor market bears some resemblance to the Japanese, although firm-internal labor markets are less widespread. Notably, Japan and Korea are the only two OECD countries where the labor force participation rates of married women with tertiary education are similar to or lower than those of women with less education (Brinton 2001).

26. Japan frequently falls out of comparative research for a number of reasons. One is certainly the language barrier, which is formidable. A second reason is that micro-level data are extremely hard to obtain in Japan (see Brinton 2003, for a review of the reasons). A third is that Japan has not participated in a number of the collaborative efforts to obtain comparable data sets across countries; the Luxembourg Income Study is a case in point.

27. They cite an unpublished piece by Peter Swenson as the source of this terminology ("Employers Unite: Labor Market Control and the Welfare State in Sweden and the U.S.," 1996).

28. A smaller number of vocational high schools specialize in training for agriculture, fisheries, home economics, and nursing.

29. Both expanded their enrollments exponentially in the post–World War II period, with junior college becoming almost entirely a female track and remaining so.

30. While a sizable proportion of each year's entering cohort at the nation's most prestigious universities are students who "sat out" for a year in order to retake the university entrance exam in order to gain admission to their top-choice school (Ono 1999), these students are not ones who, as in the United States, took a year off to experience the world of work and to think over their future occupational choices. Rather, they are primarily male students who wish to enter prestigious universities, nearly always with the purpose of gaining the credential necessary to subsequently enter one of Japan's large firms offering the promise of stable employment.

31. To date the Social Stratification and Mobility Survey, conducted every 10 years in Japan since 1955, has always collected work history information that begins after completion of formal schooling. Unlike the United States, data analysis problems based on individuals' subsequent return to schooling and reentry to the labor force have been so trivial as to occasion little debate over whether to reword the survey questions.

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