Social Protection and the Formation of Skills: 
A Reinterpretation of the Welfare State

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Abstract: This paper outlines a new approach to the study of the welfare state. Contrary to the emphasis on “decommmodification” in the current literature, we argue that important dimensions of the welfare state – employment protection, unemployment protection, and wage protection – are designed to make workers more willing to invest in firm- and industry-specific skills that increase their dependence on particular employers and their vulnerability to market fluctuations. Workers will only make such risky investments when they have some insurance that their job or income is secure. Otherwise, they will invest in general, and therefore portable, skills. In turn, because the skill composition of the work force constrains the set of product market strategies that firms can pursue successfully, employers will support social protection that facilitates the set of skills they need to be competitive in particular international product markets. We show that our argument is consistent with observed clusters of social protection and skill profiles among OECD countries, and that these clusters are associated with very different distributional outcomes and patterns of gender-specific labor market segmentation.
1. Introduction

In most of the literature, the welfare state is seen as a tool of redistribution, supplanting the market and undermining the interests of capital and the better-off. In Esping-Andersen’s seminal work, this is captured by the concept of de-commodification. De-commodification refers to the emancipation of wage earners from dependence on the market, which “strengthens the workers and weakens the absolute authority of the employer” (1990, 22). Esping-Andersen concludes that “it is for exactly this reason that employers have always opposed de-commodification.” (22). Correspondingly, the literature has understood the politics of defence of the welfare state in terms of institutions -- left parties, unions, churches, the welfare state bureaucracy itself, and groups speaking for the most vulnerable – largely opposed to the interests of business and the more educated and skilled members of the work force (Korpi 1989; Huber et al. 1993; Pierson 1996). Likewise much of the recent literature has focussed on the effects of globalization on the relative strength of these institutions (Garrett 1998; Rodrik 1997; Stephens et al., 1999).

We adopt a radically different approach, inspired by recent research by Swenson (1998), Mares (1998) and others. We find that, across advanced economies, there is a strong correlation between key components of social protection (employment, unemployment and wage protection) and the dominant character of workforce skills. Where skills are specific to a industry and/or a company there are two reasons why business will wish to maintain strong protection. First, young people will be unprepared to invest in a major way in specific skills without protection against the possible loss of employment opportunities in the use of their skill. Without such protection their incentive will be to invest in general skills which reduce dependence on particular employers. Second, where skills are specific, in particular where they are exercised collectively, employees are in a position of potential power. Companies are therefore vulnerable to collective hold-up. To avoid this, implicit agreements trading cooperation for long-term employment and real wage stability are necessary; but this requires external employment and wage protection guarantees since companies can seldom credibly make them themselves. Thus in economies in which business needs access to such skilled labour, it will have an interest in maintaining these institutions of social protection. So too will skilled workers.

Because workers willingness to invest in specific skills depend on social protection, and because the size and composition of human capital investment are essential to the success of companies on international markets, it completely transforms our understanding of the functions of social protection. What in Esping-Andersen’s terminology would be classified as de-commodifying social policies -- protection against layoffs, high compensation during unemployment, and wage guarantees – are precisely designed to overcome workers’ reluctance to invest in skills that would increase their exposure to labor market risks and make them more dependent on a particular employer (in the case of firm-specific skills) of group of employers (in the case of industry-specific skills). The implication is that de-commodification commodifies, which of course renders the whole concept meaningless.

We will argue that the weights attached to different components of social protection depend on the nature of the specific skills, in particular the balance between company and industry specificities. From this we develop an analysis of the type of alliance which might be expected to support different components of social protection. For example, in economies where companies
engage in product market strategies that require a combination of firm- and industry-specific skills, and where a large number of workers invest in such skills, a strong alliance between skilled workers and employers will emerge to support employment, unemployment and wage protection - even if this means some groups of workers (low-skilled women in particular) will find it harder to find attractive job opportunities. By contrast, where business has no common interest in the promotion of specific skills, it will have no interest in defending any of the three components of social protection. This lead to much greater inequalities in educational achievement and income, though less gender-based labor market segmentation.

What determines the type of skills business wants? The direct answer is that different product market strategies require different types of skills, so that the type of product market strategy the company wants to pursue determines the skills. Thus diversified quality production (DQP), the specialisation in high quality goods which Streeck (1991) attributes to German companies, requires employees with strong company-specific and industry skills; more standardised production, including the ability to switch rapidly between products, requires more general skills, as in the US or UK.

But companies are not free in their choice of product market strategies. Most evidently, companies need access to the necessary skills. That in turn requires, as we have seen, appropriate social protection institutions. Moreover, other institutions are also necessary: for instance, in the case of industry skills, strong employer associations are needed to develop agreed vocational training standards; and in order for the social protection institutions to function effectively strong employee representative organisations are required. Furthermore, different product market strategies require access to different kinds of finance: the longer-term the commitments companies have to make, the longer-term the finance has to be. Thus a range of complementary institutions need to be in place.

If the requisite institutions are in place, then in the language of economists, the choice of product market strategies by companies and choice of the requisite skills by employees are strategic complements. The greater the proportion of employees who choose the skills, the greater the incentive for companies to choose the production strategy and vice versa. And, so long as there is demand in world markets for different product market strategies, these processes may be reinforced by the comparative institutional advantages of different countries. Specialisation may occur both in product market strategies and in skill profiles; hence also in the nature of social protection.

A production regime is defined by the set of complementary institutions and associated choice of product market strategies and employee skill trajectories. The varieties of capitalism literature distinguishes different clusters of such institutional complementarities. The welfare state, conceived as different levels and combinations of employment, unemployment and wage protection, is another such institutional complementarity. Hence, it makes sense to talk of welfare production regimes, and a primary objective of this paper is to identify the main varieties of regimes as well as their consequences for firm behaviour, economic performance, and distribution of jobs and income.
The paper is divided into four sections. Section 2 outlines the basic argument that to understand the institutions of social protection, it is necessary to start from an analysis of production regimes. Section 3 explains how particular combinations of employment and unemployment protection are imbedded in a broader institutional setting, while section 4 explores our argument empirically. The final section concludes.

2. Product Market Strategies, Skill Types and the Welfare State

We explore the logical links between product market strategies and their welfare implications. We do so in two steps. One, we focus on the incentive structure that workers face in deciding whether to invest in further specific skill training or general education. We make three assumptions about workers’ behavior:

(i) People calculate overall return to their educational/training investment before deciding to commit themselves. (The investment cost of further training and education can be conceptualized in terms of wages foregone during the period of training and education, in addition to any tuition or training fees incurred.)

(ii) People choose to invest in those skills that generate higher expected returns, provided that the riskiness of the investments are identical.

(iii) People refrain from investing in specific skills, if the future higher returns are uncertain (i.e., people are risk averse).

Two, we assume that product market strategies affect workers’ and employers’ preferences over welfare programs and related policies. In particular, we assume that employers are aware of the incentive structure affecting workers’ skill investment decisions. In other words, a rational employer will support policies that ensure an adequate return on the worker’s skill investment. A rational employer will act in this way in order to create sufficient supply of skills they require in order to pursue the product market strategy of their choice. It follows from this that rational employers will support welfare programs and other policies that produce “the right” incentive structure, thereby reducing each individual employers’ cost of pursuing a particular product market strategy. Similarly, workers who have made investments in specific skills will rationally prefer welfare programs and policies that reward and protect these investments.

More specifically, this section contains four related arguments. First, we argue that different product market strategies are facilitated by a work force with a particular skill profiles. Second, we spell out the key argument that the propensity of individuals to invest in particular skills, which determine the skill profile of an economy, is closely linked to different types of employment protection programs. Thirdly, we extend that argument to unravel the previously neglected logic by which some product market strategies, and their associated skill profiles, perpetuate inequality or a "poverty trap." Finally, we cast light upon the gender inequality consequences of different product market strategies.
2.1. Skills and Product Market Strategies

This paper distinguishes three types of skills associated with different product market strategies: (i) firm-specific skills; (ii) industry-specific skills; and (iii) general skills. These different skills differ significantly in terms of their asset-specificity (i.e., portability). Firm-specific skills are acquired through on-the-job training, and are least portable. They are valuable to the employer who carried out the training but not to other employers. Industry-specific skills are acquired through apprenticeship and vocational schools. These skills, especially when authoritatively certified, are recognized by any employer within a specific trade. General skills, recognized by all employers, do not carry a value that is dependent on the type of firm or industry. Of course, any actual production system will involve all three types of skills to some degree. Nonetheless, we can characterize distinctive product market strategies based upon the "core" skills they require.

A high quality product niche market strategy, for instance, requires a highly trained workforce with industry-specific craft skills. The prototype of this production strategy does not involve any scale merit, and the process tends to involve highly craft-intensive workshops. A diversified mass production strategy, in contrast, aims at producing a varied range of products in large volumes. Japanese auto-makers and domestic electronic appliances industry are good examples. This production strategy depends on firm-specific skills to ensure production flexibility.

A hybrid of the above-mentioned two strategies exists. Diversified quality production is a product market strategy that aims at high quality niche market, but in larger volumes of production. This production strategy requires firm-specific skills in addition to craft skills. Germany is a prototype of this type of production.

All the above, therefore, require a range of skills very different from the Fordist mass production of standardized products. A standardized mass production system relies least on specific skills, as it only requires semi-skilled workers. Traditional US manufacturing industries such as automobiles and other consumer durables fall into this category. However, higher-level general skills can also support radical product innovation strategies, which presuppose flexibility for companies in attracting educated workers in the external market, often workers with university degrees and broad job experience from a variety of different firms and industries. Software development, segments of the telecommunications industry, and advanced consulting services are examples of such industries.

2.2. The Welfare-Skill Formation Nexus

From the assumptions stated earlier, it follows that a rational worker must consider three factors in making skill investment decisions: (i) the initial cost of acquiring the skills as, for instance, when a worker receives a reduced wage during the period of training; (ii) the future wage premium of specific skills; and (iii) the risks of losing the current job and the associated wage premium.

Because rational workers weigh higher expected income later in their career against the risks of losing their current job, the only way to encourage workers to carry a substantial part of the costs
of firm-specific training is to increase job security and/or reduce the insecurity of job loss. For firms pursuing product market strategies that depend heavily on having employees with firm-specific skills increasing job security can thus provide a cost-effective path to improving the firms’ competitive position in international markets (Ohashi and Tachibanaki eds. 1998). Contrary to conventional neo-classical theory, which sees efforts to increase protection against job loss as an interference with the efficient operation of labor markets, measures to reduce future uncertainty over employment security — hence uncertainty over future wage premiums — can significantly improve firms’ cost effectiveness (Schettkat 1993). And the more successful these firms are, the greater their demand for specific skills. We are thus in a specific skill equilibrium.

If there is little protection build into either the employment or the unemployment system, the best insurance against labor market risks for the worker is to invest in general, or portable, skills that are highly valued in the external labor market. If general skills are what firms need for pursuing their product market strategies successfully, low employment protection can thus give these a competitive edge. Indeed, if most firms are pursuing general skills strategies, then higher protection will undermine workers incentives to invest in these skills, without significantly increasing their appropriation of specific skills (because there is little demand for such skills). In this general skills equilibrium the neo-classical efficiency argument is more valid (see Chang and Wang 1995).

A focus on the core skills of an industry thus is critical, because of their varying degrees of portability. Faced with future job insecurity, a rational worker will not invest his/her time and money in skills that have no remunerative value outside the firm or industry. Without compensating institutional arrangements, no rational worker will make an extra effort to invest in asset-specific skills such as industry-specific or firm-specific skills. In other words, in the absence of institutional interventions into workers' payoff structure, general rather than asset-specific skill acquisition represents the equilibrium point.

Let us examine what types of institutional guarantees are necessary for asset-specific skills. Two different sets of guarantees can secure the supply of firm-specific or industry-specific skills: one institutional guarantee focuses upon employment protection; the other focuses upon unemployment protection. Employment protection, which is to say protection against layoffs, increases the probability of staying in the same firm. Unemployment protection, which is to say, income protection during unemployment, promises a higher rate of return on a specific skill investment. This institutional guarantee is designed to reduce the uncertainty of keeping a certain wage level, regardless of employment status — i.e., whether employed, unemployed or re-employed.

Different degrees of asset-specificity—hence portability—make different types of protection more significant for a particular kind of skill. Let us contrast firm-specific and industry-specific skills. Firm-specific skills are, ex hypothesi, worthless outside that specific firm. Since workers will only be paid the value of their non-firm-specific skills in the external market, the greater their investment in specific skills the greater the discrepancy between current wages and the wages they could fetch in the external market. In order to invest heavily in firm-specific skills, workers therefore need assurances that they can remain in the company for a long enough period to reap the returns on such investments (see Blossfeld 1987; Lazear and Freeman 1996; Osterman 1987;
Schettkat 1993). If not, the expenditures of training must be commensurably lower, and/or the premium on future wages higher. In either case, the cost of training for the firm goes up, and it will offer less training. Hence we can interpret institutionalized life-time employment, or subsidies to keep redundant workers within the firm as safeguarding mechanisms for firm-specific skill investment.

For industry-specific skills, employment protection per se matters less. If skills are truly specific only to the industry, not the firm, workers can in principle move between firms without loss of income. Instead, what becomes important for workers’ incentives to invest in industry-specific skills is the protection of "skilled wages," regardless of employment status. Unemployment protection achieves this in part by securing high wage premiums for unemployment benefits and also by helping to keep the skilled wages high even when the supply of skills exceeds the demand for those skills. In part, generous unemployment protection is also important in so far as it allows workers to turn down job offers outside their previous industry or occupation. If compelled to accept a job offer outside the worker’s core competencies, either because of low benefits or a strict requirement to accept almost any job offer, this will undermine the worker’s incentives to invest in industry-specific skills.

We mean by “generosity”--of unemployment protection--high replacement ratio and long period of benefit duration. A high replacement ratio, especially when the unemployment benefits are earnings-related, rewards the worker for his/her specific skill investment even when the worker is out of work. A high replacement ratio also eliminates the downward pressure on specific skilled wages, as unemployed skilled workers do not have to take job offers at discounted wages. Benefit duration and the administration of requirements to accept a “suitable job” further reinforces this mechanism. A longer benefit duration permits the unemployed industry-specific skill holders enough time to find another job that matches their skills, especially if they are permitted to turn down jobs that are outside their core competencies. This ensures that their re-employment will generate the same skilled wages as before, simultaneously reducing downward pressures on the skilled wages. In short, these two components of unemployment protection -- a high replacement ratio and “secure” benefits -- guarantee return on skill investment sufficient to compensate for economic fluctuations.

The predictions of the argument are summarized in table 1, which identifies the four main welfare production regimes and gives an empirical example of each (discussed below).

[Table 1 about here]

2.3. Employers, Core Workers and Median Voters

The argument presented so far explains the complementarity between different combinations of welfare programs and product market strategies. From this, it follows that rational employers who pursue distinctive product market strategies can benefit from welfare programs and policies that favor their production strategy. Complementary welfare programs and policies reduce employers’ cost of providing adequate rewards to persuade workers to invest in the skill required for specific
product market strategies. Given such benefits, employers are likely to develop preferences for the "right" sets of programs and policies.

One of the most salient divisions in employers’ preferences over types of social protection is firm size. Small firms are more severely affected by restrictions on their ability to hire and fire because they do not have the same organizational capacity to adapt to the business cycle as large firms. Moreover, small firms with limited R&D capacity typically depend more on industry technologies and skills than do large firms, which are often in a position to develop proprietary technologies based on their own R&D effort. Depending on their particular product market strategy, and hence skill needs, large firms are therefore more likely to favor high employment protection than small firms, who tend to view such protection as an unnecessary financial burden and excessive restriction on their manpower flexibility. For small firms a much more important resource in developing a healthy supply of workers with the appropriate industry-specific skills is generous and publicly financed unemployment benefits. This allows small firms to “park” some their skilled workers in the unemployment benefit system during downturns, without undermining the incentives of workers to invest in relevant skills.

Particular welfare programs and policies also have advocates among workers. Workers who have invested in asset-specific skills have critical vested interests in retaining institutions that protect them. High benefits and job security, however, can create problems of long-term unemployment and difficulties for “outsiders” to enter into the core employment structure. The greater the significance of a specific skill system in the overall national employment structure, the greater the number of workers who possess the "key skills." As a result, the median voter would tend to be an insider supporting generous protection of employment. Because the interests of these workers would be well-aligned with employers, there would be a formidable political coalition in favor of retaining existing institutions.

We can find empirical examples of such cases. For instance, employers and unions in Germany and Nordic countries negotiate to set industry-specific skilled wages. Unions intervene to maintain earnings of skilled workers by means of combining welfare benefits and wages. In so far as industry-specific skills are core skills in a dominant economy, not only are the key private unions likely to protect favorable institutions in place but the proportion of the skilled workers in the overall voting population is likely to be significant. Those not possessing the core skills would be shot out of the most attractive jobs, and in many specific-skills countries this has meant a secondary position for women in the labor market. We discuss this implication in more detail below.

In Japan, where most large companies rely on firm-specific skills, employers advocate wage subsidies during economic downturns in order to avoid layoffs (Dore 1986; Kume 1998). Japanese unions, composed of protected core workers from large corporations, support these policies. In Germany, large manufacturers rely on a combination of firm-specific and industry-specific, we observe that German employers and unions are also interested in minimizing layoff. The Mittelstand sector of small firms, by contrast, has consistently advocated deregulation of employment standards in order to increase flexibility and reduce the costs of hiring and firing. However, the Mittelstand sector is in a subordinate position in the German political economy.
In contrast to firm-specific and industry-specific skills, general skills do not require any institutional guarantee. Indeed employment and unemployment protection undermines the incentives of workers to invest in general skills. Employers pursuing product market strategies based on general skills thus have no incentive to support either the employment or unemployment protection we discussed above. Because the median voter tends to have a good general education and understands that expanding benefits and job security can have adverse effects on competitiveness, such opposition is likely to also carry the day in electoral politics. We might therefore expect that countries where the dominant product market strategy is based on general skills will have meager employment protection and unemployment benefits. The US and UK provide good examples here.

2.4. Distribution, Poverty Traps and Product Market Strategies

Our argument has far-reaching implications for equality and labor market stratification, some of which are poorly understood in the existing welfare state literature. Product market strategies that rely on high levels of industry-specific and firm-specific skills are likely to create more egalitarian societies than product market strategies based on general skills are. (Here we exclusively refer to egalitarian income distribution. When we turn to gender equality, we get a different picture, as we shall discuss in the next section.) They therefore help us understand large and persistent cross-national differences in the distribution of wages and incomes. The existing literature can only account for these differences in so far as they are caused by redistributive state policies. But what if they are the result the product market strategies, skill profiles and the institutional framework that underpin particular welfare production systems? In that case an exclusive focus on state policies and institutions will only capture part of the story.

There are two main mechanisms by which social protection affects distribution, apart from the immediate consequences of unemployment and employment protection. The first follows directly from our argument and concerns the effects on the wage structure of a particular skill system. The second mechanism runs through the collective wage bargaining system, which tends to be institutionalized in a way that is closely linked to the skill system. In this section we focus on the direct effects of particular skill systems. In the next section we discuss the role of the wage bargaining system as a complementarity to the skill system.

The basic logic of our argument is straightforward. For the bottom one third, or so, of the academic ability distribution, a developed vocational training system offers opportunities for workers to acquire skills that are valued by employers, whereas in a general education system workers who are less academically inclined have relatively few opportunities for improving their labor market value outside of the school system, and therefore fewer incentives to work hard inside the school system. At the top end of the ability distribution, by contrast, a general education system offers very large returns to those with advanced degrees, especially if they are from the best universities and colleges. These returns tend to more modest in specific skills systems because there is not a large number of companies whose success depend crucially on the ability to attract the “best and brightest” university graduates (OECD 1996). The result is a very skewed distribution of skills in a general skills system compared to specific skills systems, and this shapes the distribution of earnings.
In fleshing out this argument we focus on the "from-school-to-work" transition, which tends to be more institutionalized in specific skills countries (see Allmendinger 1989; Dore and Sako 1989). Employers dependent on industry-specific and firm-specific skills systems have a great stake in developing clear job entry patterns. In the case of industry-specific skills, employers rely on certificates from vocational schools and apprenticeship programs to screen potential employees. As a result, they are likely be more involved in controlling the quality of the certificates, thus increasing the effectiveness of those certificates as tickets into secure jobs (The European Center for the Development of Vocational Training ed. 1995; Blossfeld 1987). In the case of firm-specific skills, since employers are committed to make significant initial human capital investment in new job entrants, they will be interested in monitoring the quality of the pool of the new school leavers. As a result, they are likely to establish a working relationship with various schools for systematic hiring of new school leavers. Since employers in a firm-specific skill system carry out initial job training, new school graduates have a chance of building careers as skilled workers. This gives young school goers a strong incentive to work hard in school.

In general skill regimes, in contrast, the "from-school-to-work" transition is less institutionalized (see Allmendinger 1989). Hiring is more flexible. Employers hire new job entrants with different educational backgrounds. Promotion and opportunities for further skill training are themselves contingent upon the job performance of the worker. There is not so much initial human capital investment by employers as there is in firm-specific skill systems. Because of the absence of a clear vocational track, systems based on general skills therefore tends to disadvantage those who are not academically oriented. Regardless of the presence or absence of vocational schools and apprenticeship programs, for employers who emphasize general skills a certificate from a vocational school does not add much value to the worker. Potential workers therefore have to demonstrate their competence in terms of general scholarly achievement, and getting a tertiary degree becomes an essential component. This produces an unintended consequence for those students who are not academically inclined. Those students who do not do well in primary and secondary schools do not have the opportunity to go into more specialized vocational tracks at an early age, and they therefore have little incentive to work hard in school.

In short, in general skill systems, since the completion of elementary and secondary school does not qualify them for secure jobs — vocational certificate that lead to secure jobs — poor students face lower returns from their educational investment. Since the opportunity for vocational training — both on-the-job and off-the-job — for these students will remain low, it creates an impoverished labor pool. As a consequence, poor students in general skill regimes are worse-off than their counterparts elsewhere: they are more likely to be trapped in low-paid unskilled jobs.

2.5. Gender Equality and Skill Types

Women face an additional set of factors when making skill investment choices (see Estevez-Abe 1999). In addition to the probability of layoff, women have to take into consideration the likelihood of career interruption due to their role as mothers (see Daly 1994; Rubery, Fagan and Maier 1996). For a woman to invest in specific skills, she has to be assured that potential career interruptions will not: (i) lead to dismissal; or (ii) reduce her wage level in the long run. A high probability of dismissal reduces the incentives to acquire firm-specific skills. A high probability of
reduction in wages after becoming a mother — because of time off due to child birth and rearing — reduces the incentives to invest in either firm-specific or industry-specific skills.

For women, therefore, employment protection necessarily involves two factors in addition to the employment and unemployment protection discussed earlier. These two factors are: (i) protection against dismissal, such as maternity, parental and family leave policies; and (ii) income maintenance during leaves and guarantees of reinstatement to the same job at the same wage level upon return to work.

As for industry-specific skill investments, leave programs and generous income maintenance during the leave function in the same way as unemployment protection for male skilled workers. A higher wage replacement ratio thus encourages specific skill investment. Firm-specific and industry-specific skills again require slightly different institutional guarantees. While income maintenance during leave is sufficient for industry-specific skills, firm-specific skill investment by women faces another issue. In firm-specific skill regimes, reinstatement to the original job after the leave means that women fall behind their male cohort in skill formation and promotion. This means that despite generous income replacement during the leave, taking time off due to child birth and child rearing reduces women’s overall earnings. The very fact that the timing of child rearing years for women coincides with the critical skill formation period compounds the problem. Therefore, for women to invest in firm-specific skills, affordable childcare is more important than a family leave policy.

In short, compared to men, it takes more institutional support to encourage women to make specific skill investments. This means that employers’ incentives differ significantly from the earlier descriptions of employment and unemployment protection. From the employers’ perspective, it costs more to provide incentives for women to invest in specific skills than it does for men (Spence 1975). Not only do additional income maintenance and childcare create a greater financial burden, but they come with the organizational cost of hiring replacement workers during regular workers’ material and training leaves. Not only is it expensive to hire highly skilled workers as replacement workers, but it is also very difficult to seek those skills in the external labor market—especially in the case of firm-specific skills.

Given these additional financial and organizational costs, employers are unlikely to support family leave or childcare programs except under two circumstances: (i) when someone other than the employer covers the program expenses; or (ii) when there is an acute shortage of men willing to invest in the skills they need.

From a women’s perspective, this means that it does not pay to invest in skills for which there is an abundant supply of males. Even if a woman invests to acquire a specific skill, as far as there is an abundant supply of male skilled workers, her skill investment will not be protected to the same degree as men’s. Given this situation, women are more likely than men to invest in general skills (see Rubery, Fagan and Maier 1996). Furthermore, even women who are willing to invest in skill training will rationally choose trades and professions where there are few men. Hence a vicious cycle of occupational segregation of women arises. In countries where there is an established vocational training system, women’s enrollment choices will reflect women’s tendency to avoid "male jobs."
In short, product market strategies that rely on firm-specific and industry-specific skills are more gender segregating than product market strategies based on general skills. As we argued, general skills provide more flexibility without penalizing career interruptions, precisely because they do not require any external guarantee and reinforcement. We can thus predict that economies with a large presence of companies with specific skill strategies demonstrate high occupational gender segregation, while general skill systems are more gender neutral.

3. Institutional Complementarities

In the last section we showed how key elements of the traditional analysis of the welfare state, in particular employment protection and unemployment protection can be understood as necessary to induce young people to make different types of investments in skills. These investments correspond, in different economies, to the skills (of core workers) required by the dominant product market strategies which companies in that economy are pursuing. In turn, this suggests how political alliances, between business and groups of employees, have an incentive to defend these key welfare state institutions.

This broad approach to a reinterpretation of the welfare state is taken further in this section in four ways:

First, we suggest that the wage determination system gives a second type of protection which reinforces employment and unemployment protection; this is arguably as important as employment and unemployment protection in making sunk investments in human capital; thus wage determination should be seen by political economists - not just in macroeconomic terms but - as a critical linking institution between the welfare state and the production regime. Just as the nature of employment and unemployment protection is contingent on the type of skill investments, so too is wage protection.

Second, we will argue that these systems of employment, unemployment and wage protection, not only provide necessary incentives for engaging in investment in skills. They also play a central role in enabling companies to gain cooperation from skilled employees. Thus the interest of business in these employee protection institutions as providing incentives for skill investments is reinforced by their role in promoting cooperation. We will show that there is a relationship between skill-specificity and workforce autonomy (and hence need for cooperation); and that the same protection institutions which promote investment in a given type of skills promote cooperation by employees with those skills.

Third, the more workers depend on institutions to protect their skill investments, the greater is the need for strong employee representation (perhaps backed by legislation) as a guarantee that individual businesses will not undermine the protection institutions. But individual businesses will only be prepared to accept strong employee representation if they in turn have potentially countervailing protection either from strong employee associations or from the state. The political implication of this is that high employee protection institutions will tend to be associated with representative bodies (unions, employer associations) with an interest in defending the protection institutions.
Finally, we ask how product market strategies are determined. In doing so we bring in other institutions which are important for product market strategies, including the availability or not of long-term finance. The suggestion is that product market strategies depend on a range of institutions, including social protection systems, and which give different economies comparative institutional advantage in pursuing particular product market strategies.

3.1. Wage Protection Systems

The previous section argued that the greater the uncertainty attached to employment in the use of particular skills the greater the incentive to invest in general skills which permit mobility. The proper calculation relates to the uncertainty of income, namely employment multiplied by earnings. If there is uncertainty in the earnings from particular skills, this is as much of a disincentive to sink investments in those skills as uncertainty in employment.

At a rough first cut, then, it is necessary to provide wage protection in order to induce front-end investments in company or industry specific skills. The natural interpretation of a wage protection system is where wage determination provides a broadly stable proportionate distribution of earnings across different occupations. This is the result when there is a high degree of coordination in a system of wage determination. Thus institutionally we would expect to find coordinated wage bargaining systems in economies in which specific skills are important, and non-coordinated systems where they are not. And in terms of outcomes we would expect to find stable distributions of earnings across occupations in the first, but not necessarily the second case.

There is one complication to the above which is worth noting. A distinction can be made between wage protection for the employed and for the unemployed: For the employed wage protection means simply that wages do not fall out of line with wages in other occupations. For the unemployed, a natural definition of wage protection is that there is some guarantee that the wage at which the unemployed person is rehired is the same as wage at which he or she was previously employed. (The unemployment benefit, it will be remembered, is part of unemployment protection.)

As far as the three cases of industry-specific, company-specific and general skills are concerned, employed wage protection and unemployed wage protection are the same. In the first two cases, they are both high; in the third case they are both low. But in the case of company-specific skills employed wage protection is high but unemployed wage protection is low. This mirrors the (very) high employment and low unemployment protection in the Japanese case. And it can be explained in the same way: if an employee has a “lifetime” employment and employed wage protection guarantee, at least so long as he works effectively, there constitutes an effective incentive for the potentially responsible employee to invest appropriately in company-specific skills. Low unemployment and unemployed wage protection serve as a disincentive to leave the company or to work in such a way as might lead to dismissal.

The association between skills and wage bargaining has implications for the distribution of earnings. Wage bargaining systems have consequences for the wage structure for three associated reasons. First, as implied by our argument, intra-occupational compression of wages serves as a
complement to employment and unemployment protection because it help insure against a big drop in income if a workers loses her job. Secondly, to the extent that collective bargaining systems are designed to prevent poaching, they limit the ability of individual firms to pay wages that significantly above the negotiated rate. The third reason has to do with the effect of collective bargaining arrangements on the relative bargaining power of different income groups. Collective bargaining at the industry or higher levels bring diverse income groups into a collective decision-making process, and this afford low income groups with opportunities to influence the distribution of wages that they lack in more fragmented systems.

3.2. Employment, Unemployment and Wage Protection and the Need for Cooperation

The two requirements that employers have of employees are that they have the skills the employer needs and that they use those skills cooperatively. Depending on the nature of the skills, employers may also want to be able to make credible commitments to continued employment and stable wages in order to secure workforce cooperation.

In the absence of uncertainty, there is no economic problem with securing workforce cooperation; the employer can write an enforceable contract specifying the required performance of the employee. In most situations however the employer cannot observe costlessly the performance or output of the employee.

Under such circumstances, one of the best known models of the eliciting of worker cooperation or effort is that of Efficiency Wages (Shapiro and Stiglitz 1984). Here the employer monitors the employee on a random basis (to reduce the overall cost of monitoring). If the employee is discovered shirking s/he is fired. The employer sets the wage suitably above unemployment benefits and wages elsewhere, so that the employee has an incentive not to shirk. The wage has to be set higher, the higher is (i) the unemployment benefit (unemployment protection), and (ii) the alternative wage (unemployed wage protection); moreover to operate efficiency wages requires low employment protection - in order to be able to fire workers, and low employed wage protection - in order to set wages to fit the conditions of the company. Thus the interest of the employer is in low employment protection, low unemployment protection and low employed and unemployed wage protection.

But there are a number of conditions in which it is difficult to apply the efficiency wage model. First, where skills are company-specific, the costs of firing are high. Second, where employees need to be given autonomy in their work environment, it is typically too costly to monitor performance. Third, the model cannot be applied where workers work jointly together in such a way that their individual contribution cannot be easily disentangled. Finally, and following on from this, where the work environment is such that workers can coordinate action against management - engage in “collective hold-up” (Williamson, 1985) - individual sanctions are unlikely to work. We can very roughly associate these four conditions with environments in which employees acquire deep company- and/or industry-specific skills. And we can roughly associate their absence with predominantly general skills - so that efficiency wages then apply.
The alternative method of inducing cooperation in the deep specific skills world is by entering into an implicit long-term agreement with the workforce. The problem with such an agreement is shown in Figure 1. In essence, employees ask: “what guarantee do we have that the company will honour an implicit long-term agreement, when it might well be in the interest of the company not to do so?” If the company is better off paying poor rewards out of the high productivity resulting from cooperation, the employees may prefer the moderate rewards which come from hold-up. Indeed, cet par this is the sub-game perfect solution in this time inconsistency game.

To support implicit long-term agreements, therefore, the company needs to be able to offer guarantees about future employment and earnings. Hence in with deep specific skills employers require institutions of wage and employment protection. Thus we reinforce the conclusions of the protection institutions needed for inducing investment in human capital:

With general skills, employers want low employment, unemployment and wage protection. Employers here secure cooperation by monitoring and individual incentive schemes, of which efficiency wages is the classic example.

With specific skills, employers want high employment and wage protection. They secure cooperation by exchanging it for high employment and wage protection in long-term implicit agreements.

3.3. Specific skills, unions and employer associations.

The preceding sub-section makes clear why employment protection is associated with effective employee representation at company level: Neither high wage nor high employment protection can be laid down contractually, since there will always be unforeseen circumstances in which exceptions may have to be made. But employees will not be prepared to allow management the prerogative in deciding when circumstances dictate that wages (or other conditions) should be reduced or when employment should be terminated. Hence employee representative bodies, endowed with suitable powers and access to relevant information, are necessary if there are to be satisfactory long-term implicit agreements between management and skilled employees.

But, although effective employee representation at company level is necessary to gain employee cooperation, it is not sufficient. This is because an effective employee representation body puts in principle a ready vehicle for collective action into the hands of the employees.

Companies will not be prepared to accept this situation if they have no recourse in the event of the employee representative body trying to impose decisions on it to which it objects. Thus companies will need a counterweight. This is the role of strong employer associations. As we shall see in the next sub-section, there are other important reasons why there should be employer representative bodies when employees have specific skills. What we have shown here is that such bodies play a necessary role in the way in which employment and wage protection works.
3.4 *Product market strategies, skills and institutional complementarities.*

The argument of the paper so far has taken the product market strategies of companies as exogenous: the product market strategies of companies determine their skill requirements; the skill requirements then determine the need for social protection; and taken one step further in the last subsection, effective social protection implies employee and employer representative bodies.

But this raises two problems. First, it does not explain why companies have adopted the product market strategies (PMS) they have. For example, if companies can choose their PMS costlessly, the whole argument becomes insubstantial since it implies that social protection might change from one moment to the next. A satisfactory theory of social protection (along our lines) requires a satisfactory theory of PMS choices. Second, we have implicitly assumed that there are dominant PMSs in different economies, corresponding to the dominant modes of social protection. A theory of PMS choices needs to be able to explain why this assumption is reasonable.

Such a theory can be developed in five steps:

(i) There are many different world markets to which different PMSs can cater.

(ii) A modern organisational economics view of companies (e.g., Milgrom and Roberts 1992) sees top management as engaged in problematic relations with employees (including their developing appropriate skills and using them cooperatively), with other companies (problems of technology transfer and appropriation) and with owners or financers (corporate governance problems).

(iii) Any particular PMS requires particular employee skills and cooperation, relations with other companies, and with financers. For example, DQP requires company and industry specific skills, needs to allow employees considerable work autonomy, needs to be able to cooperate with other companies in the industry in technology transfer, and requires long-term finance to make credible long-term commitments to employees and other companies. Each of these relations poses problems for the company whose resolution depends upon external institutions.

(iv) The company is faced by a set of institutions, primarily defined at the national level, covering education and training and industrial relations (including the systems of social protection), the financial system and the system governing relations between companies (competition policy, technology transfer and standard setting). These national institutional systems vary sharply across countries (Soskice 1999, Hall and Soskice 1999).

(v) The feasible set of PMSs in a given national environment are those whose relational problems are solved by the relevant national institutional framework. Thus the PMS choice a company makes is constrained by the relevant national institutional framework.¹

The above explanation ((i) though (v)), endogenizes PMS choices in different economies by making them partially dependent on the relevant national system of social protection. Thus the overall argument of the paper now stands:
Feasible PMS choices depend on national institutional frameworks, including the system of social protection.

PMS choices determine company requirements in terms of employee investment in skills and cooperation in their use; this explains the political position of companies towards social protection.

Three complementarity-type effects reinforce the implicit assumption we have made of a dominant PMS and set of skill types.

First, there are strong complementarities between the PMS choices of companies and the related skill investment choices of individuals in a particular economy. Assume that the national institutional framework, including of course the social protection system, makes a particular PMS feasible. In this case, the more individuals invest in the relevant skill, the easier it is for companies to find employees with the relevant skills. This makes it more attractive for firms to pursue PMS that use the particular skill intensely, and this in turn makes it more attractive for individuals to invest in the skill (because demand for it will rise, while demand for other skills will fall). This strategic complementarity produces an equilibrium with very high investment and hiring in the particular skill.

Second, many institutions exhibit economies of scale or network externalities, as the number of companies or individuals “using” them increase. For example, the cost of providing long-run finance falls as the number of companies engaged in long-run relations with other companies increases, since this makes it easier for banks to reputation monitor companies to whom they lend money, since there is more information available.

Effects such as these mean that the greater is investment and hiring in particular skills, the more effective are the relevant institutions, and that in turn will increase the incentive to follow this PMS and to invest in the corresponding skills. This is then the situation of strategic complementarities between skill investment and hiring on the one hand and the corresponding institutional framework on the other.

The third reinforcing effect is that of comparative institutional advantage. If a PMS can only be easily carried out within a particular national institutional framework (ie without subsidies, tariffs etc), then an increase in trade liberalisation will increase the demand for the output of that PMS from the economies in which there is an appropriate national institutional framework. Thus, against the hypothesis that trade liberalisation leads to a downwards pressure on domestic institutions, comparative institutional advantage suggests the opposite.

Finally, particular welfare production regimes build up strong constituencies for their survival. That is indeed a major point of this paper. The interests of business and skilled employees are in defending the institutions which makes the PMSs companies have adopted sustainable. Just as skilled employees, if they have acquired specific skills, cannot without substantial cost develop skills in a different area, so too managers acquire skills corresponding to a PMS. In the liberal market economies management skills are general, reflecting the need to switch companies and sectors: the manager’s interest is in a deregulated environment which facilitates movement. But in
organised market economies, DQP-type PMSs require managers to develop company and industry specific expertise; and the power base of top managers is in industry associations.

Only when the national institutional framework does not effectively support the PMS, or when world markets or changing technologies require changes in the dominant PMS, will top management and industry associations support change. But even then the change will be designed to create a profitable environment in which their competencies and power networks are disturbed as little as possible.

4. Comparative Patterns

Our argument implies a tight coupling between employment protection, unemployment protection, and skill formation. The precise predictions of the argument vary according to the combination of employment and unemployment protection. Although the two tend to go together, there are conditions in the firm structure of countries, as well as circumstances in the historical development of different welfare production regimes, that have led some countries to emphasize employment protection over unemployment protection, or vice versa. As we noted in the theoretical discussion, political opposition to strong employment protection legislation will be greater in countries with a high proportion of small firms.

The predictions of our model are provided in Table 1. Recapitulating the argument, when neither employment or unemployment protection is available, workers have a strong incentive to protect themselves against labor market insecurities by investing heavily in highly portable skills. Since workers are reluctant to take on specific skills in this scenario, or at least unlikely to contribute much to the cost of providing such skills, firms have an incentive to use technologies that make intensive use of more general skills. By doing so, they increase the size of the external market, which makes general education more attractive for workers, thus creating a self-reinforcing dynamic. In this case we expect skill profiles to be heavily tilted toward general and broad occupational skills, with a weak or absent vocational training system.

When employment and unemployment protection is high, on the other hand, it makes it relatively more attractive for workers to invest in firm- and industry-specific skills. In turn, this makes it more cost-efficient for firms to engage in production that require large inputs of labor with specific skills, and as firms specialize in this type of production they shrink the market for general skills. Company and vocational training will therefore tend to be strong, and we expect higher education to focus on occupations that are more narrowly defined than in the low protection countries. Note here that a standard trade argument supports the idea of self-reinforcing dynamics in both types of systems because there would be a comparative advantage for companies to specialize in production that uses the relatively more abundant skill “factor” most intensely.

Yet, not all countries necessarily conform to these two ideal types. Where companies can offer very high levels of job protection and a large and attractive internal labor market, firm-specific skill formation can flourish in the absence of strong unemployment protection (represented by the southeast corner of Table 1). If career opportunities are extensive within the firm, and if firms make credible commitments to job security, the external labor market will be small and workers
will have an incentive to take advantage of internal career opportunities by investing in company-specific skills. This, essentially, is the Japanese case (see Aoki 1988; Koike 1994). Most firms, however, neither have the size nor the institutional commitment “technology” to make heavy investment in firm-specific skill an attractive low risk strategy for workers. It is for this reason that we would ordinarily expect the development of firm-specific skills to be coupled with generous protection against unemployment, which we call unemployment protection.

On the flip side of the Japanese system, we find welfare production regimes with extensive unemployment protection, but low or only modest employment protection. Especially in economies dominated by small firms, with small internal labor markets and little organizational capacity to adapt to business cycles, employment protection is costly and unattractive for employers. Denmark is an archetypical example of an economy with a small-firm industrial structure. On the other hand, unemployment protection is still a requisite for workers to invest in industry-specific skills in these cases, much the same way as employment protection is a requisite for investment in firm-specific skills. In effect, unemployment protection increases employment security within the industry, as opposed to security within a particular firm. At a high level of abstraction, therefore, the industry in a country with high unemployment and low employment protection becomes functionally equivalent to the firm in a country with low unemployment and high employment protection.

4.1. Measuring Protection

There are no direct measures of job security, such as the risk of non-voluntary dismissals, that can be used consistently across national cases. However, there are quite good data on the legal framework governing hiring and firing, as well as on the institutional features of companies that impact on employment security. Thus the first column in Table 2 shows OECD’s ranking of countries according to the “strictness” of employment protection, based primarily on the legal code affecting the difficulty of dismissing workers, hereunder what constitutes just cause, the required length of advance notice, mandated severance pay, the compensation for unfair dismissals, and the rights of employees to challenge dismissals in the courts. Needless to say, this is a complicated assessment because it involves weighting the importance of very different variables, and because the applicability of the law often varies across groups of workers as well as in the national stringency of implementation (Moseley and Kruppe 1992). Still, the cross-national differences on most indicators are large enough to give a good sense of the relative ordering of countries, and it is not surprising to find the Anglo-Saxon countries in the bottom half and many of the continental European countries in the top half. Note, however, that Denmark, the Netherlands, and Switzerland fall out of the pattern, most likely because these countries have relatively large small-firm sectors.

Japan, however, illustrates the main limitation of the legal employment protection index. As acknowledged by the OECD (1994, 79-80), companies in Japan offer far greater protection against dismissals for their skilled workers than the legal index would lead one to expect. Indeed, dismissals and layoffs are extremely rare in Japan compared to other countries (OECD 1997, table...
The problem is that the legal measure does not capture employment protection that is build into the firm governance structure or into the workings of the industrial relations system. In many countries, firms have to consult with works councils or other employee representative bodies before making decisions about layoffs, and in other countries firms engage special workforce loan practices (called “Shukko” in Japan where it is most prevalent), which enable them to retain workers during recessions (see Dore 1986).

We have captured these “private” employment protection arrangements in Table 2 by a simple index that measures the strength of institutions and practices at the firm level increasing the job security of especially skilled workers in a company. The measure is based on three criteria: i) the presence of employee-elected bodies with a significant role in company manpower decisions; ii) the existence of strong external unions with some monitoring and sanctioning capacity (especially through arbitration); and iii) the systematic use of employee sharing practices between parent companies and subsidiaries or across companies. Where at least two of these conditions are met to a considerable degree, we assigned a score of 3; where all three are largely absent, we assigned a score of 1. Intermediary cases were assigned a score of 2. Note that the index of company-based protection is broadly in line with the OECD measure for most countries, but it is higher for Japan and lower in the cases of Ireland and, less so, Belgium and Italy.

The third column combines the OECD and company-based measures in a composite index that captures both the legal and more informal aspects of employment protection. Again, the Anglo Saxon countries are that the low end, joined by Denmark, the Netherlands, and Switzerland. Two other countries characterized by relatively small firm structures, Finland and Norway, are just above the median.

The measurement of unemployment protection is more straightforward, although there are some non-trivial issues concerning the administration of unemployment benefit systems. The most obvious indicator, and the most commonly used, is unemployment replacement rates; i.e., the portion of a worker’s previous wage that is replaced by unemployment benefits (see column 1 of Table 3). We are here considering a “typical” worker, defined as a 40 year old industrial production worker, “averaged” across several different family types (single, married to working spouse, and married to non-working spouse), and we are looking at net replacement rates that adjust for cross-national differences in tax systems and non-income subsidies for unemployed (such as rent support). Given that taxation of unemployment benefits varies considerably across countries, gross replacement rates (for which much more detailed data exist) can be misleading.

As in the case of employment protection, the Anglo Saxon countries again score at the bottom. But note that the three continental European countries that fell in the lower half of the employment protection indicators – Denmark, Netherlands, and Switzerland – now figure at or near the top of the table. On the other hand, two countries – Italy and Japan – have very low replacement rates compared to their position on the employment protection indicators. The pattern is broadly similar, though not identical, when we look instead at the actual amount of money government spend on unemployment benefits (as a share of GDP), compared to the number of unemployed people (as a share of the population). As before, the three countries in
northern Europe with relatively low employment protection are among the five countries with the most generous unemployment benefit systems.

Table 3 also includes a more qualitative measure of the administration of unemployment benefits: The restrictiveness of the definition of a “suitable job.” All countries stipulate that in order to receive unemployment benefits a person cannot refuse a “suitable” job, but what constitutes a “suitable job” varies significantly from one country to another. In principle, such variation is important for our purposes. Thus, if a skilled worker is essentially forced to take any available job, regardless of whether it is commensurable with the worker’s skills and education, high unemployment benefits are of limited value from the perspective of reducing the riskiness of specific skills investments. In practice, our classification “suitable job” definitions, based on a variety of national and international sources, basically reinforce the pattern revealed by the other two indicators.

As in the case of employment protection, we combined the various indicators into an index of unemployment protection (see column 4). With the possible exception of Italy, this index gives a good sense of cross-national differences in the extent of unemployment protection. The number for Italy probably underestimates the extent of protection because of quasi-public insurance schemes that do not show up in the official statistics. Thus, about a third of (mainly large companies) covered by Casa Integrazione have replacement rates between 70 and 80 percent, and there are normally good unemployment benefit schemes for artisans (i.e., craftsmen) run at the regional level by associations representing small firms, in conjunction with regional governments.6

Finally, we need to consider measures of the profile of skills in different countries. Again, we combine quantitative indicators with a more qualitative assessment. The first is median enterprise tenure rates, which show the median number of years workers have been with their current employer. These numbers contain relevant information about the firm-specificity of skills because firms and individuals investing heavily in such skills become increasingly dependent upon one another for their future welfare. The greater the investment, the higher the opportunity costs of severing the relationship, and the lower the incentive for either party to do so (everything else being equal). Indeed, short tenure rates may not only be an indicator of the absence of firm-specific skills, but a positive measure of presence of general skills. The reason is that general skills are developed in part by accumulating job experience from many different firms. Correspondingly, whereas a personal cv that indicates frequent job switching tends to be seen as a reason for apprehension about the applicant in countries such as Japan or Germany, it tends to be seen as a qualification in countries like Britain or United States.

It is true that the costs for employers must also in part reflect the level of employment protection. However, if higher tenure rates were unrelated to the extent of firm-specific skills, then the association between employment protection and tenure rates would be weak at best since most job switching is voluntary. In fact, the cross-national association between the two variables is almost perfect (r=0.84), as illustrated in Figure 2. From this evidence it seems clear that at least part of the effect of employment protection on tenure rates must go through the effect of the former on the stock of firm-specific skills. This interpretation is supported by considerable evidence showing tenure rates across industries within countries to be closely associated with the skill intensity of these industries (OECD 1993, 141-5).
Used as a measure of firm-specific skills (column 1 in Table 4), tenure rates suggest that the stock of such skills is low in the Anglo Saxon countries compared to Japan or most of the continental European countries where workers stay with their firms for significantly shorter periods of time. As in the case of employment protection, the exceptions are Denmark, the Netherlands, and Switzerland where tenure rates also tend to be quite short.

The pattern of training suggested by tenure rates is reflected in the character of vocational training systems (column 2). Whereas the Anglo Saxon countries and Ireland have very weak vocational training systems, all the other countries have some form of institutionalized support for such training. The main difference among the latter is in the emphasis on company as opposed to industry-level training. Whereas in Japan, and to a lesser extent in France and Italy, the emphasis is on company training, the remainder have some combination of on-the-job training and school-based training, with heavy involvement of industry organizations and unions in the latter. Formally, the systems can be divided into apprenticeship systems of the German type, vocational school systems of the Swedish type, or mixtures between the two, but all combine some combination of theoretical, industry-specific, and direct workplace training. The weight between the three is difficult to gauge empirically across time and space, but Belgium, the Netherlands and the Scandinavian countries (less so Sweden) tend to place more emphasis on school-based training (i.e., provision of non-firm-specific skills) than Austria or Germany.

An additional indicator of skill profiles is the share of young people with post-compulsory education (column 3). Unlike tenure rates, there is no indication on this measure that Anglo Saxon countries are less skill intensive than continental European countries (no comparable data are available for Japan). As in any advanced economy, a high average standard of living in the Anglo Saxon countries depends on heavy investment in human capital. Indeed, there is some indication that countries with only a modest stock of firm-specific skills compensate by investing more heavily in higher education. Using the proportion of young people with a university degree (the second entry in column 3) as the indicator, the relationship is illustrated in Figure 3, which uses tenure rates as a proxy for specific skills. Although Germany is an outlier, and although there appears to be two clusters of countries, the figures indicates a negative relationship between specific skills and university degrees. The US can here be highlighted as an archetypical case of a country with a weak company and vocational training system, but a very advanced higher education system. Indeed, a college education in this country is widely considered the only effective insurance against an otherwise highly volatile and uncertain labor market.

The figures for upper-secondary education hide more subtle differences in the content of this education. In the Anglo-Saxon countries university educations tend to be very general, and even engineering and business schools provide very broad training that is not linked to particular industries or trades. By contrast, in Japan and the continental European countries, many university degrees are more specialized and there tend to be close linkages between engineering and trade schools to private industry. Combined with the other two indicators, this paints a fairly clear
picture of the skill profile in different countries, summarized in column (5) of Table 4. Needless to say, all training systems produce a whole range of skills, but each system can be fairly accurately characterized according to its emphasis on firm, industry, occupational, or general skills.

4.2. Putting the Pieces Together

Figure 4 plots the 18 OECD countries on the employment and unemployment protection indexes. Countries are distributed along a primary axis, with a some further divided along a secondary axis. The main axis corresponds to the southwest-northeast diagonal in Table 1, and clearly separates countries into two distinct welfare-production regimes: One combining weak employment and unemployment protection with a general skills profile, represented by the Anglo-Saxon countries (and to a lesser extent Ireland); and one combining high protection on at least one of the two dimensions with firm- and/or industry-specific skills, represented by Japan and the continental European countries. The secondary axis divides the latter group into one with greater emphasis on employment protection and the creation of firm-specific skills, exemplified primarily by Japan and Italy, and one with greater emphasis on unemployment protection and the production of industry-specific skills, exemplified by Denmark, the Netherlands, and Switzerland.

The empirical patterns we observe thus corresponds rather closely to our main theoretical thesis, namely that skill formation is closely linked to social protection. This finding helps us understand the product market strategies of companies and the creation of comparative advantages in the global economy. Thus, where there is a large pool of workers with advanced and highly portable skills, and where social protection is low, companies enjoy considerable flexibility in attracting new workers, laying off old ones, or starting new production lines. This flexibility allows for high responsiveness to new business opportunities, and facilitates the use of rapid product innovation strategies. In economies with a combination of firm- and industry-specific skills, such strategies are hampered by the difficulty of quickly adapting skills to new types of production, and by restrictions in the ability of firms to hire and fire workers. On the other hand, these welfare-production regimes advantage companies that seek to develop deep competencies within established technologies, and to continuously upgrade and diversify existing product lines (“diversified quality production” in the terminology of Streeck, 1991).

In an open international trading system, these differences in product market strategies will tend to be perpetuated, which in turn feed back into organized support for existing social protection regimes. Contrary to the popular notion of a “race to the bottom” in social policies, differences across countries persist and are even attenuated through open trade. Correspondingly, from the 1970s to the 1980s and 1990s, unemployment benefits remained stable or rose in most continental European countries, but they were cut in Ireland and all the Anglo-Saxon countries with the exception of Australia. Furthermore, whereas labor markets have become even more deregulated in the latter countries, employment protection has remained high in the former (OECD 1997, p. ). This evidence, and the theoretical explanation we provide for it, seriously challenge the notion, popular in much of the economic literature, that social protection is simply inefficient forms of labor market “rigidities.” By the same token it questions the prevalent approach in the
sociological and political science literature, which understands social protection solely in terms of its redistributive effects. Such protection can provide import competitive advantages for particular types of firms.

4.3. Implications for Labor Market Stratification

That said, we are not implying that welfare production regimes are irrelevant for distributive outcomes. As explained above, our argument has important implications for equality and labor market stratification. Partly a direct effect of product market strategies and their associated skill profiles; partly it is an indirect effect through the collective wage bargaining systems that are linked to the production of particular skills.

Indeed, countries with an emphasis on the development of industry-specific skills (those in the upper part of Table 5) have all developed highly organized collective wage bargaining systems at the industry level or above. Whether bargaining is conducted at the national peak level or at the industry level depends on macroeconomic policies that are exogenous to the present argument (see Iversen 1999, and Iversen and Soskice 1999 for details). For our purposes the more important contrast is between the coordinated bargaining that occurs in systems promoting industry-specific skills, and the lack of such coordination in those systems that primarily produce general skills.9

There is mounting evidence that both skill profiles and wage bargaining institutions affect the wage structure (see ??; Rowthorn 1993; Wallerstein 1999; and Reuda and Pontusson 1999). The basic relationship is easily gleaned from Table 5, which includes figures for earnings and income inequality. The Scandinavian countries with the historically most centralized bargaining systems (at least before the 1980s) are also the most egalitarian, followed by those with industry-based, multi-employer bargaining systems. All these systems have an emphasis on industry-specific skills or a combination of industry- and firm-specific skills. The big drop in earnings equality occurs when we move to welfare production systems with emphasis on firm specific-skills and company bargaining (as in Japan), or general skills and weak and fragmented bargaining systems (as in the US). With the exception of Austria, there is a strong positive relationship between the centralization of the bargaining system and income equality (the simple correlation is .90 for wage equality and .80 for net income equality).

A different check on the argument about the relationship between product market strategies, skill composition, and equality is to focus on the "school-to-work" transition. The demand for good potential skilled workers among young people who are not academically inclined, and the presence of an effective screening system in the "school-to-work" transition, create strong incentives among young school goers to do as well as they can in school in order to get the best vocational training spots. By contrast, in general skills systems, those at the bottom of the academic ability distribution face few prospects of further training outside the school system and will not be screened for their training potential in the school-to-work transition. Consequently, they have few incentives to work hard in school. If correct, we should expect the number of
school children who fail internationally standardized tests to be higher in general skills countries than in specific skills countries.

Although the data is limited in coverage, this is in fact what we observe (see Figure 5). Whereas the percentage failing the test varies between 15 and 22 percent in the Anglo-Saxon countries, it is only between 8 and 14 in the countries emphasizing more specific skills for which we have data. Although these differences could be due to the overall quality of the educational system, it is not that case that the Anglo Saxon countries spend less money on primary education, and there is no systematic difference in average scores. This points to the importance of incentives outside the school system, which vary systematically according to the dominant product market strategies of firms and their associated demand for particular skills.

[Figure 5 about here]

But general skills systems are not necessarily bad for all types of inequality. They perform better in terms of gender equality at work (Estevez-Abe 1999). When we compare degrees of occupational segregation, specific-skills systems fare worse than general skills systems. Specific skills systems segregate women into "female occupations" such as low-rank clerical and service jobs. Table 6 shows the occupational breakdown of women employed in manufacturing sector expressed in terms of percentage of women over total workforce within the same category. While the data are not conclusive, it nonetheless shows that countries (see Germany and Sweden in the Table 6) that adopt high quality product market strategies--thus dependent on high industry-specific skills--employ women for production jobs to a lesser degree. The US, the archetypical general skills system, shows significantly higher ratios of women in technical and managerial positions when compared to specific skills systems. Our findings support Esping-Andersen's argument about the US employment system being more gender-equal than that found in Germany and Sweden (Esping-Andersen 1999). Our explanation, however, differs from his.

[Table 6 about here]

5. Conclusion

Protection of employment and income is widely seen in the welfare state literature as reducing workers’ dependence on the market and employers (“decommodification”). In turn, this is argued to reflect a particular balance of power between labor and capital. We reject both theses. Although strong unions and left governments undoubtedly affect distributive outcomes, we have argued that employment and income protection can be seen as efforts to increase workers’ dependence on particular employers, as well their exposure to labor market risks. Moreover, social protection often stems from the strength rather than the weakness of employers.

The key to our argument is the link between social protection and the level and composition of skills. In a modern economy, skills are essential for firms to compete in international markets, and
depending on the particular product market strategy of firms, they rely on a workforce with a certain combination of firm-specific, industry-specific and general skills. To be cost-effective firms need workers who are willing to make personal investments in these skills. And if firms want to be competitive in product markets that require an abundance of specific skills, workers must be willing to acquire these skills at the cost of increasing their dependence on a particular employer or group of employers. Because investment in specific skills increases workers’ exposure to risks, only by insuring against such risks can firms satisfy their need for specific skills.

The particular combination of employment protection and unemployment protection determines the profile of skills that is likely to emerge in an economy. Thus employment protection increases the propensity of workers to invest in firm-specific skills, whereas unemployment protection facilitates investment in industry-specific skills. The absence of both gives people strong incentives to invest in general skills. These predictions are borne out by the comparative data, which show that most countries combine either low protection with general skills, or high protection with specific skills.

Two factors contribute to the distinctiveness and resilience of particular welfare production regimes. The first is that such regimes tend to be reinforced by institutions – collective wage bargaining systems, business organizations, employee representation, and financial systems -- that facilitate the credible commitment of actors to particular strategies, such as wage restraint and long-term employment, that are necessary to sustain cooperation in the provision of specific skills. The second is that those workers and employers who are being most advantaged by these institutional complementaries also tend to be in strong political positions, both in terms of economic clout and cheer numbers. For example, the more a welfare production system emphasizes the creation of specific skills, the more likely it is that the median voter will be someone with considerable investments in specific skills, and the more likely it is that employers’ interest organizations will be dominated by firms pursuing specific skills strategies.

Both will contribute to perpetuating institutions and policies that advantage firms and workers with heavy investments in specific skills.

Our argument has broader implications for our understanding of the welfare state that reach well beyond the immediate effects of employment and income protection. In particular, earnings dispersion, by far the most important determinant of the overall distribution of income, is closely related to particular skill systems as well as the wage bargaining institutions that tend to go with these systems. Similarly, the combination of particular product market strategies and skills have distinct effects on the career opportunities of particular groups, especially women. Thus, our theory implies that gender-based segmentation of the labor market varies systematically across welfare production systems.

Clearly, what we have done in this paper is to outline a broad research agenda for the study of the welfare state rather than testing a specific set of hypotheses that follows from it. Much work needs to be done, for example, in testing whether public opinion, voting behavior, and the preferences of employers conform to the predictions of the theory. Another big task is to rewrite social history to take into account the preferences of employers, and the attempt by firms to engage in particular product market strategies. Some work in this area has already be undertaken by Mares (1998) and Swenson (1998), but there are ample opportunities to expand on their
pioneering research. Finally, much work remains to be done to explore the implications of our argument for labor market stratification. We have indicated the empirical relationship between skill profiles, wage bargaining systems, and labor market stratification (including women’s position in the labor market), most of the empirical work is still to be done.
Notes

1. To carry forward the example of DQP: the organised market economies of northern Europe (Sweden, Germany, Denmark, Switzerland, Austria) all have broadly similar national institutional frameworks – long run financial systems, industry based technology transfer and standard-setting, as well as vocational training systems, coordinated wage determination and employment and unemployment protection. These institutions help solve the relational problems associated with DQP production. (The company of course can always locate non-feasible PMS activities, which it wants to pursue, in an appropriate institutional environment abroad if it so chooses.)

2. Formally the economic logic is this: the larger the % of individuals who have invested in the relevant skills \(S\), the easier it is for companies to find employees with the relevant skills; hence, if \(p\) is the probability that a company will choose the relevant PMS, \(p=p(S)\), where \(p\) increase in \(S\). If \(s\) is the probability that an individual invests in the relevant company/industry skills, then the higher is \(p\), the return to investing in the company/industry skills: this is not only because there will be a greater demand by companies for the skills, but also – critically – it will be difficult to get employment with only general skills as the proportion of companies who want general skills declines. Since \(s=S(p)\), with \(S\) increasing in \(p\). Putting these two equations together, we end in equilibrium with high values of both \(S\) and \(p\). This is the case of direct strategic complementarities between \(S\) and \(p\).

3. Or, the larger the number of companies who are members of employer associations, the easier it is for the association to sanction members who misbehave, and hence the more effectively the association can solve collective action problems. Or, the larger the proportion of companies who sign up to collective wage agreements the less the likelihood of poaching.

4. See OECD (1997, p. 147) for a discussion of these measurement problems

5. These data are not fully comparable across countries, but the figure for Japan is order of magnitudes smaller than in any other country for which data is available.

6. We thank Michele Salvati for providing this information.

7. Although the position of Italy is probably exaggerated by the failure to account for semi-public unemployment insurance arrangements, as noted above.

8. Based on gross unemployment replacement rates published in OECD’s Database on Unemployment Benefit Entitlements and Replacement Rates (undated).

9. France and Japan are in intermediary positions because their welfare-production regimes do facilitate investment in general skills, but there is less of a need for industry-level coordination of wage bargaining.
Bibliography


European Commission. Unemployment in Europe. [Various years].


OECD, Database on Unemployment Benefit Entitlements and Replacement Rates (undated).


Table 1. Social protection and predicted skill profiles.

<table>
<thead>
<tr>
<th>Unemployment protection</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Employment protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Industry-specific skills</td>
<td>Industry-specific, firm-specific skill mix</td>
</tr>
<tr>
<td></td>
<td>Example: Denmark</td>
<td>Example: Germany</td>
</tr>
<tr>
<td>Low</td>
<td>General skills</td>
<td>Firm-specific skills</td>
</tr>
<tr>
<td></td>
<td>Example: United States</td>
<td>Example: Japan</td>
</tr>
</tbody>
</table>
Table 2. Employment protection in 18 OECD countries.

<table>
<thead>
<tr>
<th></th>
<th>(1) Legal employment protection(^a)</th>
<th>(2) Company-based protection(^b)</th>
<th>(3) Index of employment protection(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>16</td>
<td>3</td>
<td>0.9</td>
</tr>
<tr>
<td>Germany</td>
<td>15</td>
<td>3</td>
<td>0.9</td>
</tr>
<tr>
<td>Sweden</td>
<td>13</td>
<td>3</td>
<td>0.9</td>
</tr>
<tr>
<td>Italy</td>
<td>18</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Belgium</td>
<td>17</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Japan</td>
<td>8</td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td>France</td>
<td>14</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Norway</td>
<td>11</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Finland</td>
<td>10</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Netherlands</td>
<td>9</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Switzerland</td>
<td>6</td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>Denmark</td>
<td>5</td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
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<td>12</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
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<td>7</td>
<td>1</td>
<td>0.2</td>
</tr>
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<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Australia</td>
<td>4</td>
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<td>0.1</td>
</tr>
<tr>
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<td>1</td>
<td>0.0</td>
</tr>
<tr>
<td>United States</td>
<td>1</td>
<td>1</td>
<td>0.0</td>
</tr>
</tbody>
</table>

\(^a\) Rank-order index of the legal “restrictiveness” of hiring and firing rules (high numbers mean more restrictive regimes). Source: OECD Employment Outlook (1993).

\(^b\) Measure of company-level employment protection based on three criteria: i) the presence of employee-elected bodies with a significant role in company manpower decisions; ii) the existence of strong external unions with some monitoring and sanctioning capacity (especially through arbitration); and iii) the systematic use of employee sharing practices between parent companies and subsidiaries or across companies. Where at least two of these conditions are met to a considerable degree, we assigned a score of 3; where all three are largely absent, we assigned a
score of 1. Intermediary cases were assigned a score of 2. The French case has been assigned a score of 2 even though company-level protection is weak. The reason is that the Inspectorat du Travail can and does intervene to prevent redundancies, and this is not captured by OECD’s legal measure of employment protection. See Berton et al. (1991) for a description of the French system. Sources: Income Data Services, Industrial Relations and Collective Bargaining. London, Institute of Personnel and Development, 1996; OECD Employment Outlook (1998), 142-52; David Soskice (1999).

c) Average of columns (1)-(2) after each indicator has been standardized to vary between 0 and 1.
Table 3. Unemployment protection in 18 OECD countries.

<table>
<thead>
<tr>
<th></th>
<th>(1) Net unemployment replacement rates(^a)</th>
<th>(3) Generosity of benefits(^b)</th>
<th>(2) Definition of “suitable” job(^c)</th>
<th>(4) Index of unemployment protection(^d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
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<td>76</td>
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<td>0.91</td>
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<tr>
<td>Netherlands</td>
<td>58</td>
<td>74</td>
<td>3</td>
<td>0.89</td>
</tr>
<tr>
<td>Switzerland</td>
<td>(40)</td>
<td>94</td>
<td>2</td>
<td>0.86</td>
</tr>
<tr>
<td>Belgium</td>
<td>57</td>
<td>99</td>
<td>2</td>
<td>0.82</td>
</tr>
<tr>
<td>Austria</td>
<td>43</td>
<td>78</td>
<td>3</td>
<td>0.81</td>
</tr>
<tr>
<td>Germany</td>
<td>43</td>
<td>66</td>
<td>3</td>
<td>0.77</td>
</tr>
<tr>
<td>Norway</td>
<td>40</td>
<td>40</td>
<td>3</td>
<td>0.64</td>
</tr>
<tr>
<td>Sweden</td>
<td>30</td>
<td>52</td>
<td>3</td>
<td>0.63</td>
</tr>
<tr>
<td>France</td>
<td>48</td>
<td>44</td>
<td>2</td>
<td>0.54</td>
</tr>
<tr>
<td>Finland</td>
<td>45</td>
<td>20</td>
<td>2</td>
<td>0.43</td>
</tr>
<tr>
<td>Ireland</td>
<td>(38)</td>
<td>59</td>
<td>1</td>
<td>0.37</td>
</tr>
<tr>
<td>Japan</td>
<td>10</td>
<td>48</td>
<td>2</td>
<td>0.33</td>
</tr>
<tr>
<td>Canada</td>
<td>32</td>
<td>49</td>
<td>2</td>
<td>0.30</td>
</tr>
<tr>
<td>New Zealand</td>
<td>31</td>
<td>44</td>
<td>1</td>
<td>0.27</td>
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<tr>
<td>Australia</td>
<td>32</td>
<td>30</td>
<td>1</td>
<td>0.22</td>
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<td>2</td>
<td>0.18</td>
</tr>
<tr>
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<td>15</td>
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<td>0.11</td>
</tr>
<tr>
<td>United States</td>
<td>14</td>
<td>26</td>
<td>1</td>
<td>0.10</td>
</tr>
</tbody>
</table>

a) Net unemployment replacement rates for a 40 year old representative worker. \textit{Source:} Restricted OECD data reported in Esping-Andersen (1999), Table 2.2., p. 22. Net figures for Ireland and Switzerland are missing and have instead been estimated by taking gross replacement rates for these countries as proportions of average gross replacement rates and then multiplying these proportions by average net replacement rates. \textit{Source:} OECD, \textit{Database on Unemployment Benefit Entitlements and Replacement Rates} (undated).

b) The share of GDP paid in unemployment benefits as a percent of the share of unemployed in the total population. Average for the period 1973-89. \textit{Sources:} Huber, Ragin, Stephens (1997);

c) Index that measures the restrictiveness of the definition of a “suitable job” in the administration of benefits to unemployed. 1: Any job qualifies as a suitable job; 2: Skilled unemployed are given some discretion in rejecting jobs they deem unsuitable to their skills, but choice is restricted in time and/or to certain job categories; 3: Skilled unemployed exercise wide discretion in accepting or rejecting jobs on the grounds of the suitability of the job to their skills. Sources: OECD, “Unemployment Benefit Rules and Labour Market Policy.” Employment Outlook, 1991, 199-231; European Commission, Unemployment in Europe (various years); and national sources.

d) Average of column (1)-(3) after each indicator has been standardized to vary between 0 and 1.
Table 4. Skill profiles in 18 OECD countries.

<table>
<thead>
<tr>
<th></th>
<th>(1) Median length of tenure&lt;sup&gt;a)&lt;sup&gt;</th>
<th>(2) Vocational training system&lt;sup&gt;b)&lt;sup&gt;</th>
<th>(3) Upper-secondary and university education&lt;sup&gt;c)&lt;sup&gt;</th>
<th>(5) Skill profile&lt;sup&gt;d)&lt;sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>6.9</td>
<td>Dual apprenticeship</td>
<td>71</td>
<td>Firm/industry/occupational</td>
</tr>
<tr>
<td>Germany</td>
<td>10.7</td>
<td>Dual apprenticeship</td>
<td>81</td>
<td>Firm/industry/occupational</td>
</tr>
<tr>
<td>Sweden</td>
<td>7.8</td>
<td>Vocational colleges</td>
<td>74</td>
<td>Firm/industry/occupational</td>
</tr>
<tr>
<td>Norway</td>
<td>(6.5)</td>
<td>Vocational colleges</td>
<td>82</td>
<td>Industry/occupational</td>
</tr>
<tr>
<td>Belgium</td>
<td>8.4</td>
<td>Mixed</td>
<td>53</td>
<td>Industry/occupational</td>
</tr>
<tr>
<td>Japan</td>
<td>8.3</td>
<td>Company-based</td>
<td>n.a.</td>
<td>Firm/occupational</td>
</tr>
<tr>
<td>Finland</td>
<td>7.8</td>
<td>Vocational colleges</td>
<td>67</td>
<td>Industry/occupational</td>
</tr>
<tr>
<td>Italy</td>
<td>8.9</td>
<td>Company-based</td>
<td>38</td>
<td>Firm/occupational</td>
</tr>
<tr>
<td>France</td>
<td>7.7</td>
<td>Company-based</td>
<td>60</td>
<td>Firm/occupational</td>
</tr>
<tr>
<td>Ireland</td>
<td>5.3</td>
<td>Weak</td>
<td>50</td>
<td>Occupational/general</td>
</tr>
<tr>
<td>Netherlands</td>
<td>5.5</td>
<td>Mixed</td>
<td>62</td>
<td>Industry/occupational</td>
</tr>
<tr>
<td>Switzerland</td>
<td>6.0</td>
<td>Dual apprenticeship</td>
<td>80</td>
<td>Industry/occupational</td>
</tr>
<tr>
<td>Denmark</td>
<td>4.4</td>
<td>Mixed</td>
<td>66</td>
<td>Industry/occupational</td>
</tr>
<tr>
<td>Canada</td>
<td>5.9</td>
<td>Weak</td>
<td>76</td>
<td>Occupational/general</td>
</tr>
</tbody>
</table>

<sup>a</sup> Median length of tenure in years.

<sup>b</sup> Type of vocational training system:
- Dual apprenticeship
- Vocational colleges
- Mixed

<sup>c</sup> Percentage of upper-secondary and university education.

<sup>d</sup> Skill profile:
- Firm/industry/occupational
- Industry/occupational
- Occupational/general
<table>
<thead>
<tr>
<th>Country</th>
<th>Median Length</th>
<th>Character</th>
<th>Vocational Training</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>5.0</td>
<td>Weak</td>
<td>General</td>
<td>First entry is the percentage of 25-34 years old with an upper-secondary education; the second entry is the percentage of 25-34 years old with a university degree (1996 figures). Data is not available for Japan. Source: OECD Education Database. Paris: OECD, 1999.</td>
</tr>
<tr>
<td>United States</td>
<td>4.2</td>
<td>Weak</td>
<td>General</td>
<td>Average of column (1)-(4) after each indicator has been standardized to vary between 0 and 1.</td>
</tr>
</tbody>
</table>
Table 5. Skill profiles, wage bargaining systems, and equality in 18 OECD countries.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>Firm/industry/occupational</td>
<td>Peak level coordinated (.49)</td>
<td>0.49</td>
<td>0.36</td>
</tr>
<tr>
<td>Norway</td>
<td>Industry/occupational</td>
<td>Peak level coordinated (.53)</td>
<td>0.48</td>
<td>0.36</td>
</tr>
<tr>
<td>Denmark</td>
<td>Industry/occupational</td>
<td>Peak level coordinated (.46)</td>
<td>0.46</td>
<td>0.35</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Industry/occupational</td>
<td>Industry coordinated (.37)</td>
<td>0.39</td>
<td>0.34</td>
</tr>
<tr>
<td>Finland</td>
<td>Industry/occupational</td>
<td>Industry coordinated (.42)</td>
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<td>0.36</td>
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<tr>
<td>Belgium</td>
<td>Industry/occupational</td>
<td>Industry coordinated (.32)</td>
<td>0.43</td>
<td>0.36</td>
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<td>Austria</td>
<td>Firm/industry/occupational</td>
<td>Industry coordinated (.44)</td>
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</tr>
<tr>
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<td>Firm/industry/occupational</td>
<td>Industry coordinated (.33)</td>
<td>0.40</td>
<td>0.31</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Industry/occupational</td>
<td>Industry coordinated (.25)</td>
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<td>0.29</td>
</tr>
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<td>Italy</td>
<td>Firm/occupational</td>
<td>Industry coordinated (.17)</td>
<td>0.40</td>
<td>0.32</td>
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<td>France</td>
<td>Firm/occupational</td>
<td>Mixture (.12)</td>
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<tr>
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<td>Firm/occupational</td>
<td>Mixture (.26)</td>
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<td>0.24</td>
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<tr>
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<td>Occupational/general</td>
<td>Mixture (n.a.)</td>
<td>n.a.</td>
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</tr>
<tr>
<td>United Kingdom</td>
<td>Occupational/general</td>
<td>Uncoordinated (.17)</td>
<td>0.32</td>
<td>0.21</td>
</tr>
<tr>
<td>Canada</td>
<td>Occupational/general</td>
<td>Uncoordinated (.07)</td>
<td>0.23</td>
<td>0.26</td>
</tr>
<tr>
<td>Country</td>
<td>Occupational/General</td>
<td>Uncoordinated</td>
<td>D9/D1</td>
<td>D9/D1</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------</td>
<td>-----------------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td>Uncoordinated</td>
<td>0.35</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(n.a.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td></td>
<td>Uncoordinated</td>
<td>0.34</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(n.a.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td>Uncoordinated</td>
<td>0.19</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.07)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a) See Table 4.


c) D9/D1 earnings ratios are gross earnings (including all employer contributions for pensions, social security etc.) of a worker at the bottom decile of the earnings distribution relative to the worker at the top decile. Figures are averages for the period 1977-1993. Source: OECD Employment Outlook (1991, 1996).

e) D9/D1 income ratios are disposable income of a person at the bottom decile of the earnings distribution relative to a person at the top decile. Most figures are from the early 1990s, with a few from the 1980s. Source: Gottschalk and Smeeding (1997), Figure 2.
Table 6. Ratio of women by occupation in manufacturing a)

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Professional, technical &amp; related workers (%)</th>
<th>Administrative &amp; managerial workers (%)</th>
<th>Clerical &amp; related workers (%)</th>
<th>Sales workers (%)</th>
<th>Service workers (%)</th>
<th>Production and related workers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>1989</td>
<td>22%</td>
<td>26%</td>
<td>70%</td>
<td>33%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Japan</td>
<td>1988</td>
<td>10%</td>
<td>7%</td>
<td>58%</td>
<td>11%</td>
<td>40%</td>
<td>39% c)</td>
</tr>
<tr>
<td>Germany</td>
<td>1986</td>
<td>15%</td>
<td>11%</td>
<td>59%</td>
<td>52%</td>
<td>67%</td>
<td>21%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1993</td>
<td>14%</td>
<td>0%</td>
<td>55%</td>
<td>32%</td>
<td>45%</td>
<td>12%</td>
</tr>
<tr>
<td>Sweden</td>
<td>1989</td>
<td>15%</td>
<td>57%</td>
<td>25%</td>
<td>72%</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>1987</td>
<td>8%</td>
<td>18%</td>
<td>20%</td>
<td>43%</td>
<td>76%</td>
<td>31%</td>
</tr>
</tbody>
</table>

a) Percentages represent the ratio of women over the total of men and women employed within each occupational category in manufacturing.

c) The female ratio for occupational category (6) in Japan appears higher than predicted by our model. This is due to the demographically shrinking pool of young male workers (Estevez-Abe (1999)).

Figure 1. The problem of cooperation with specific skills

Employees

Cooperate

Employer

Collective hold-up

Moderate rewards; low productivity

Good rewards; high productivity

Poor rewards
Figure 2. Employment protection and tenure rates.

Sources: See Table 2 and 4.
Figure 3. Tenure rates and investment in university degrees.

Notes: X-axis is the percentage of 25-34 years old with a university degree

Sources: See Table 4.
Figure 4. Social protection and skill profiles

Sources: See Table 2, 3, and 4.
Figure 5. The failure of high school student to pass standardized test in 11 OECD countries.

Notes: The numbers are the percentage of all students taking the test who get a failing score. Average across four test categories. The Belgian figure refers to Flanders only.

Source: OECD (199?)