

THE FUTURE OF THE HIGH-SKILL EQUILIBRIUM IN GERMANY

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Is the celebrated German skills system in peril? Western German employers have cut apprenticeship places since the 1980s, while the institutional supports of the 'high-skill equilibrium' (HSE) analysed by Finegold and Soskice (Oxford Review of Economic Policy, 4(3) 1988) are threatened: the globalization of equity markets menaces the 'patient capital' on which German companies depend; lean production techniques have rendered strategies of incremental innovation vulnerable on international markets; and German employers and labour face mounting organizational difficulties. This article derives implications from the HSE-model to assess these challenges against existing evidence. In fact, only the declining capacity of employers' associations and unions constitutes an empirically verifiable threat to the German apprenticeship system, the magnitude of which depends on questionable assumptions of the HSE-model. Of potential future salience, though, is the growing importance of service-sector jobs and the further training system in Germany, which may eventually undo the political compromise on which the HSE has historically rested.

I. INTRODUCTION

In the course of less than a decade, the German model of apprenticeship and the 'high-skill, high-wage' equilibrium of which it is a constituent part have gone from the status of paragon to that of problem-case within the OECD. The virtues attributed to the German system were to produce a majority of the work-force with certifiable interme-

diate skills through a system in which employers made significant, uncovered investments in the general skills of their workers. Overcoming the problem of socially sub-optimal investment in skills identified by Gary Becker (1964) at a time when the return to skill was acknowledged to be increasing across the industrialized countries, the German system seemed to provide an institutional model within which companies would pay workers to acquire formally cer-

¹ I have benefited in the writing of this article from exchanges with the contributors to a volume that I recently edited with David Finegold, *The German Skills Machine: Comparative Perspectives on Systems of Education and Training*, which is forthcoming this autumn from Berghahn Books. I acknowledge in the text my explicit intellectual debts to the authors, but I should absolve them here from any responsibility for my interpretations of their findings.

tified general skills that would in turn allow workers to increase their productivity and increase their wages, while keeping their companies competitive (Finegold and Soskice, 1988; Streeck, 1992; Lynch, 1994). In addition, the close connection that apprenticeship created between training and work resulted in a youth unemployment rate that was low by international standards (cf. Harhoff and Kane, 1997).

Circa 1990, the apprenticeship system was said to be embedded in a high-skill equilibrium by virtue of its complementarity with other institutional features of the West German political economy: the financial system, the system of industrial relations, and the predominant organization of production. The relative preponderance of bank-based finance in Germany, accompanied by extensive cross-shareholding and regulation that discouraged hostile takeovers, enabled these companies to take a longer view than companies operating in equity-based systems such as the UK and the USA (Finegold, 1991; Albert, 1993). Such a long-term view is essential for the establishment of apprenticeship training, which only yields returns to a company over the long run. The German industrial relations system, with powerful industrial unions involved in regional wage bargaining and legal representation in plant decision-making through works councils, made it difficult for companies to pursue competitive advantage through a strategy of slashing wages and prices (Streeck *et al.*, 1987; Soskice, 1994). Finally, and crucially, the apprenticeship system produced a work-force with the level of technical skills necessary to maintain a system of manufacturing production based around incremental customization rather than either Fordist mass production or radical innovation. It is this system of production—most commonly called diversified quality production (DQP)—that allowed German companies to remain competitive in international markets despite their high fixed labour costs (Sorge and Streeck, 1988; Streeck, 1992).

Today, even some of the formerly enthusiastic proponents of the competitive possibilities of the German high-skill, high-wage system have lost confidence in its continued viability (Streeck, 1997; Herrigel and Sabel, forthcoming). There is a variety of putative causes of the crisis: the globalization of financial markets, changes in the organization of production, and the declining capabilities of employers' associations and unions, all compounded by a

western German government staggered by the fiscal strain of incorporating the states of the former German Democratic Republic into the united Federal Republic. In this article I try to evaluate the seriousness of these problems, and to understand to what extent the concept of a high-skill, high-wage equilibrium still has any empirical referent in the united Germany. Section II revisits the high-skill equilibrium model of Finegold and Soskice (1988) to derive the causal pathways by which that model might be challenged by developments in the real world. In section III we look at the behaviour of firms and workers in both western and eastern Germany to see if the two central parties to the training relationship are still investing in skill provision through the apprenticeship system; the answer is largely affirmative in the western case and somewhat negative in the eastern case. Section IV then considers in turn each of the other major institutions of the political economy—finance, productive organization, and industrial relations—to see whether changes in these systems are under way that will destabilize the apprenticeship system. In the first two cases, the answer is clearly not; the evidence in the third case is more potentially damaging, although I argue that how one reads the evidence depends on assumptions about how employers perceive the value of training one's own apprentices. Finally, in section V, I speculate on the potential political problems that the high-skill equilibrium is likely to confront in the near future, whose implications are not easily derived from the theory of Finegold and Soskice.

II. THEORETICAL DANGERS TO THE HIGH-SKILL EQUILIBRIUM

The core achievement of the high-skill equilibrium is the production of a work-force in which a large majority of workers have certified intermediate-level skills: roughly two-thirds of any given German youth cohort go through the apprenticeship system. German employers invest in apprenticeship training even though they have no formal means to ensure they will be able to reap the benefit of that investment, as the former apprentice can always choose to shop his general skills to other firms willing to pay him the full marginal product of his labour. At the same time, apprentices accept low wages in order to learn skills that will supposedly offer them a

higher return over the life-cycle, despite the risk that a guileful employer may use the apprenticeship period for cheap labour without conferring the agreed-upon skills on the apprentice. The latter risk has been attenuated by the system of skill certification, in which the state delegates to the organized representatives of employers and workers the definition of occupational certifications, whose testing is then regulated in most instances by the private-interest government of the chambers (*Kammern*) (Streeck *et al.*, 1987).² However, the answer to the former question—how German firms have been convinced to make these uncovered investments in apprenticeship training—remains to this day a point of contention among social scientists (Soskice, 1994; Streeck, 1996; Harhoff and Kane, 1997).

The currently prevailing explanation of this phenomenon among political scientists is that premised on the high-skill equilibrium (HSE) analysis of Finegold and Soskice (1988; Soskice, 1994). The HSE depends on the ability of private organizations—notably, employers' associations and the chambers—to provide employers with capacities of information-circulation, deliberation, monitoring, and sanctioning, which allow them to minimize the risk of opportunistic behaviour on the part of other employers (Hall and Soskice, forthcoming). Information circulation allows companies to learn from other companies about innovations in training practice, while at the same time giving the association access to information about the needs of a large cross-section of firms in production.³ With access to this information, the association is able to serve as a forum for inter-company deliberation over the necessary revisions of training certifications, and the capacity for collective action conferred by the associations gives employers a recognized way to try to balance the needs of firms in different sectors. Similarly, companies are collectively willing to tolerate intrusive monitoring by the chambers, because the chambers are a private-interest governance structure ultimately controlled by employers themselves. This monitoring helps to assure apprentices that they are

not being exploited, but more importantly (for the general problem of employer investment in human capital), it assures employers that other employers are not defecting in the game of skill provision. Moreover, employers are both *dissuaded* from abusing their apprentices' trust and *persuaded* that other firms are doing likewise by the existence of sanctions for defectors. This includes not merely the sanction of preventing a firm from having chamber approval to train, but also an informal sanctioning mechanism by which firms can be threatened with the denial of other benefits (e.g. technology transfer) that they normally receive from their association (Soskice, 1990, 1994). The employer-led sanctioning capacity is reinforced by the statutory power of works councils, especially in large firms (Streeck *et al.*, 1987); Soskice (1994) argues that these works councils can supervise hiring policy to dissuade would-be poaching firms from using wage premiums to attract newly trained apprentices from other firms.

The HSE is a product of the incentives that face firms and potential trainees, given these organizational supports. Empirically, a sustained mismatch between firm participation and youth participation in the system would indicate that, for whatever reason, either companies or workers had lost incentive to invest in human capital development through the system. Moreover, because of the equilibrium nature of the system, it is likely that there is a tipping point beyond which the changed incentives trigger lower participation, which in turn would change incentives, and so on. For example, from the perspective of an employer currently engaged in apprenticeship training, declining participation by other firms increases the perceived risk of poaching, thus decreasing the incentive of that firm to train. The logic is self-evident: an employer who witnesses a decline in the number of firms that train their own apprentices (or in the proportion of apprentices relative to total employees in the firm) perceives *ipso facto* an increase in the number of firms that may try to lure away his or her trainees after their

² Of course, the system only works to provide general skills because unions and employers' associations in Germany are both aware that the other side is sufficiently well-organized not to be cowed into sacrificing too much for its constituency. In France, by contrast, the certifications awarded at the end of the *contrat de qualification* (similar to German apprenticeship) are 'jointly' negotiated between unions and employers' associations, but their content is far more heavily weighted towards firm-specific skills than is true in Germany (Charraud *et al.*, 1997).

³ Companies may not be willing to share with the state the same information that they will share with their association; in particular, they are loath to have their internal training monitored by the state. And this, as pointed out by Finegold and Soskice (1988), makes trusted and capable employers' associations the *sine qua non* of an HSE.

apprenticeship because they do not train their own apprentices.

Similarly, declining participation could have a tipping-point from the perspective of young Germans. One of the successes of the dual system has been its ability to motivate young people in Germany to acquire sound basic skills in the system of general schooling in order to have access to the best apprenticeship places. As argued by Soskice (1994), the predominant road to secure employment and a place in the high-wage economy runs through apprenticeship; this fact creates an incentive for school-leavers not planning to acquire post-secondary education to work hard in school. In the USA and the UK, by contrast, the wage pay-off to making such an investment is perceived by those not planning to go to university to be marginal. Secondary school achievement sorts those in the broad middle of the German skills distribution, and the existence of labour markets governed by skills certifications (and characterized by relatively low mobility) increases the cost of *not* choosing apprenticeship (Hinz, forthcoming). Thus, if German firms reduce their net apprenticeship training, that reduction may lead to an unravelling of the incentive system that has motivated these students to achieve in secondary school, which would trigger further reductions in firm training places as would-be training firms would then face increased asymmetries of information in trying to distinguish between the capabilities of potential apprentices.

The incentive system of young people could also imperil the HSE from the other end of the skills distribution: that is, those on the border between apprenticeship and post-secondary education. The oft-cited threat here would be a convergence of the behaviour of German students on the French model, in which students increasingly attend higher-education institutions in preference to (or after) taking the highest prestige apprenticeship positions. This threat to the HSE, like the one posed by the incentive system of intermediate students, would be problematic because of the potential for self-perpetuation: the greater difficulty of the best firms to attract and retain high-achieving apprentices would over time convince these firms to seek skilled workers through other means. The fewer the high-prestige apprenticeships available, the more relatively attractive is

higher education to school-leavers deciding between apprenticeship and university education, and the HSE suddenly finds itself in disequilibrium.

(i) Dangers of Institutional Instability

The existence of a sustained mismatch between firm offers of apprenticeship and the demand of young people for apprenticeships would be evidence that the apprenticeship system was already in crisis. Yet the dual system interacts with the other key institutions of the German political economy, such that changes in any one of them might have future consequences for the system of German skill provision, even though that might not be reflected in the current data on the ratio of firm places to apprentices. In this section I examine the dyadic 'partial equilibria' created by the interaction of the skills system with the most important institutions of the political economy: finance, production, and industrial relations. Such a presentation suggests the nature of the threat to the skills segment of the HSE that could be posed by different sorts of institutional change in the German political economy.

The fundamental contribution of the German financial system to the HSE is the facilitation of a long time horizon for company managers, one by which investment in human capital has time to yield its rewards. Apprenticeship training yields positive returns for the company in its future supply of skilled workers attuned to the corporate culture, but on the balance sheet at any given time it looks like extra costs with no immediate return (and no long-term return that can ever be guaranteed). The German system of finance used to be led by house banks that maintained long-term relationships with companies, sitting on their supervisory boards so as to be able to oversee their management. The predominance of bank finance, in a system of cross-shareholding where the banks could vote each others shares, made hostile takeovers a rarity in Germany in the 1980s and 1990s (Lane, 1995). Having access to long-term finance, oversight by bank representatives who are aware of the prevalence of training in other firms (where they also sat on the supervisory boards), and not being threatened that a bad quarter may have resulted in a turnover in management, all provided some insulation within which managers could invest in training without needing to show

immediate returns.⁴ Thus, one could foresee at least two causal pathways by which changes in the financial system could destabilize the HSE in Germany. First, an increasing reliance by companies on equity-finance would at the same time pressure them towards greater responsiveness to the requirements of quarterly accounting statements. Second, a reduced ability of German banks to monitor companies would have much the same result of pushing the banks towards methods of greater transparency of the management strategy (so as to get access to finance from equity markets). Change in the financial system would not directly influence the efficacy of training, but it would make continued uncovered investment in apprenticeship training more difficult for managers to justify.

Changes in the organization of production could reduce the attractiveness of the dual system as a means for companies to train their workers in the skills they perceive as necessary. As argued most famously by Wolfgang Streeck (1992; Sorge and Streeck, 1988), West German manufacturing companies in the 1980s maximized their international competitiveness by aiming at less price-sensitive niches where customers most valued the ability to make incremental customizations to existing technology; the classic DQP sector is machine tools. The dual system of apprenticeship gives workers the breadth of skill necessary to be easily incorporated into firms where they might have to rely on their technical virtuosity to meet the new demands of a customer. If the dual system were no longer able to provide a base level of skills perceived by companies as relevant for production—either because the skills demanded by DQP production have changed, or if DQP methods of production are no longer used by German employers—then we would expect the HSE to be disequilibrated. Such a problem would eventually be reflected in an ‘immediate’ crisis of the system, in which there are chronically not enough employers offering places to maintain the HSE. Yet there could be a time-lag, or a learning curve, during which employers become increasingly dissatisfied with the skill system as they realize their needs in production either are not included in the requirements for skill certification, or that the balance between social and technical skills has changed so much that apprenticeship no longer seems like the

appropriate way to teach the new mix of skills that an employer wants (cf. Regini, 1997).

The organizations of the industrial relations system, on which a negotiated skills system ultimately depends, comprise the institutional linchpin of the HSE. Powerful employers’ organizations provide the coordinating capacity that is necessary for companies to be willing to invest in the system: they circulate information, provide a forum for deliberation among employers, and provide baseline monitoring and sanctioning of companies that fail to meet minimal training standards (Soskice; 1994, Hall and Soskice, forthcoming). The participation of unions in the negotiation of certification content guarantees potential apprentices that general, portable skills will be included in their apprenticeships; works councils provide firm-level representation to prevent individual deviations from prescribed behaviour, which also raises a potential hurdle for large companies that would try to adopt a strategy of poaching; and the high negotiated wages that result from sectoral wage bargaining close off a Fordist strategy of competition on the basis of price rather than quality. Unlike the financial system and the organization of production, the industrial relations organizations not only support the HSE indirectly, but are also directly responsible for its day-to-day functioning (e.g. through the negotiation of new skill certifications).

The potential for a derailing of the high-skill equilibrium from this direction is correspondingly larger than for the other two main institutions of the political economy because the potential sources of failure are more numerous. If the power of the unions is undermined too dramatically, it would have the indirect effect of lowering the average wage settlement, and thus putting one less constraint on employers to choose the high-skill model, while also (in the long run) eroding the confidence of apprentices that their apprenticeships will have given them general skills. The effect of weakening employers’ associations depends, ultimately, on the relative importance of information circulation and deliberation as opposed to monitoring and sanctioning among the collective goods they provide. Soskice, relying on the literature of the new economics of organization, has argued strongly that monitoring and sanc-

⁴ By way of contrast, Finegold (1991) cites evidence of company managers in the UK that had to conceal training that they were doing because it did not fit in their quarterly budgets.

tioning capacities are necessary for the employers' association to be able to compel its members (if only informally) to participate in the training system. In my own work, I have disputed this account empirically, emphasizing information-circulation and collective position-taking as the only important collective roles played by employers' association in the German system (Culpepper, 1996, 1998).⁵ Both arguments assume strong capacities on the part of German employers' associations, and both agree that the system only works in the presence of strong and capable employers' associations. However, because the Finegold–Soskice model relies on an (organizationally more difficult) ability to sanction member firms that are not training to the levels associated with the HSE, it should be even more sensitive to variations in the capacities of employers' organizations than a model that stresses mainly the role of information-circulation. Either way, a reduction in the capacity of employers' associations should cause the HSE to break down, though a decline in the power of employers' organizations should engender a breakdown more quickly if sanctioning is, indeed, necessary for associations to coordinate employer provision of apprenticeship training through the dual system.

It is not the goal of this paper to adjudicate between these two views, but rather to examine the current situation in Germany in order to determine the severity of the crisis of the German HSE based on both models. The next section looks at the participation by firms and young people in the apprenticeship system, and section IV then examines the existing correlate to the theoretical threats to the HSE that I have just described.

III. DO COMPANIES AND WORKERS STILL USE THE DUAL SYSTEM?

There is not one dual system to assess at the present time, but two: the western German one with which

we have become familiar, and the eastern German one that is very much in transition. The future of training in eastern Germany is not divisible from the German skill provision system as a whole—a theme to which I return below—but it is risky to compare firm and youth training behaviour in the united Germany with data from the former West Germany. The western German situation is the most relevant one for the question of this article: does the HSE still elicit cooperative training behaviour from companies and from trainees? The results in eastern Germany, where there is an ongoing attempt to transfer the high-skill equilibrium, are analytically distinct from those observed in western Germany, although prolonged non-convergence would constitute a form of crisis. In this section I consider the two cases separately, and in later sections I reconsider them jointly.

(i) Western Germany

In the recent history of the Federal Republic, the supply of apprenticeship places offered by western German employers has tracked, if imperfectly, the number of young people seeking traineeships, as indicated in Table 1 (Wagner, forthcoming).⁶ Table 1 depicts the number of in-firm places offered in comparison to the number of young people demanding an apprenticeship over the past two decades.⁷ Two observations emerge from the data in Table 1: first, 1992 (the height of the post-unification boom in western Germany) was characterized by the largest dearth of apprentices in comparison with the number of firms seeking them throughout this period; and second, 1997 was the first year since the mid-1980s (when there was an increase in size of the cohort of school-leavers) that the number of apprenticeship places offered fell below the number of young people seeking an apprenticeship place. Those who would argue that the steep decline in apprenticeship places offered by companies has resulted in an immediate disequilibrium problem of sustainability—who argue, in other words, that the

⁵ I return to this issue at the end of section IV.

⁶ Many of the data used in this section were brought to my attention by Karin Wagner (forthcoming).

⁷ The figures in Table 1 come from the official yearly training report of the Federal Office for Vocational Training. Employers argue that the data overstate the number of potential apprentices, because some young people who register at the employment offices as 'apprenticeship-seekers' actually choose to do something else (e.g. continue in full-time education). Unions counter that the aggregate number of in-firm places offered hides the fact that many apprentices must take positions that they find 'second-best', because they were unable to secure a slot in their preferred profession. Both points are true, but there is no reason to believe these sources of bias have changed over time, so the official figures are the best available indicator to assess changing youth and firm behaviour in western Germany.

Table 1
Apprenticeship Places Offered and Apprenticeship Seekers, 1977–97, Western Germany

Year	Apprenticeship places	Youth seeking apprenticeships	Places/Seekers (%)
1977	584,000	585,000	99.7
1982	651,000	665,000	97.9
1987	690,000	680,000	101.6
1992	623,000	511,000	121.8
1997	487,000	494,000	98.6

Source: BBWFT (1998).

system is dangerously out of kilter because firms are no longer supplying sufficient places for the young people demanding them—will find little support in Table 1. In terms of the balance between a supply and demand of apprenticeship places, the boom year of 1992 is the outlier, and 1997 marks a return to a rough balance between the two parties to the training contract.

As the previous section has made clear, the HSE depends not only on maintaining a balance between the places offered and the youths seeking apprenticeship, but also on being able to produce a sufficient level of skilled workers to power the DQP-economy. The western German economy is producing 100,000 fewer places than it was 20 years ago, and 200,000 fewer places than it was just 10 years ago: are these the symptoms of disequilibrium? While there is no available evidence that can answer this question unequivocally, there are precious few indicators that youth disinterest in apprenticeship threatens to topple the HSE. Those with a pessimistic view of the continued viability of the dual system perennially express concern that further education will become increasingly attractive relative to apprenticeship, thus eroding the ability of firms to attract highly qualified skilled workers through the dual system (e.g. Büchtemann and Vogler-Ludwig, 1998). It is certainly true that an increasing number of German apprentices (over 15 per cent) have passed the entrance examination for universities, but this seems merely to have ratcheted up the political pressure to increase the number of pathways between the systems of vocational and higher education, rather than to have decreased the interest of youth in acquiring an apprenticeship certification (Wagner, forthcoming; Finegold, forth-

coming). The one statistical test of the determinants of the training behaviour of German youth of which I am aware found that 97 per cent of the variation in observed demand by students for apprenticeship places between 1980 and 1996 was explained by changes in demography, economic structure, and the number of firms offering places (Behringer and Ulrich, 1997). The issue of articulation with the system of general education is an important one for the German vocational education and training system, but it is not one that appears to be reducing the supply of apprentices so as to subvert the high-skill equilibrium.

The HSE analysis rests on a two-sector model of apprenticeship, in which large, industrial firms make heavy net investments in their apprentices, whereas small, craft firms are able to break even in their apprenticeship training, because their skill demands are lower and the apprentices can more quickly be integrated into production (Soskice, 1994; von Bardeleben *et al.*, 1995; Wagner, forthcoming). Thus, the import of the modest decline in the total number of firm apprenticeship places during the 1990s depends on where those places are being lost: if it is especially the large, technologically advanced firms that are failing to offer places, then the HSE would be in more trouble than if the cuts had come from the lower-skill segments of the economy. There are two measures of training behaviour: whether a firm is training apprentices at all (a binary measure), and the proportion of apprentices to the total work-force within a company, which measures the relative importance of apprenticeship training (the apprentice ratio). In the past, small firms have maintained higher apprentice ratios, but retained fewer of their apprentices, than the large firms,

Table 2
Proportion of Training Companies and Apprentice Ratios, by Firm Size Category

Employment	Proportion of companies training		Apprentice ratio	
	1990	1995	1990	1995
1-9	21	17	10.9	8.0
10-49	52	47	8.3	6.6
50-499	74	68	5.9	4.5
500 +	94	94	5.2	4.3
Total	28	24	7.0	5.5

Source: Adapted from Wagner (forthcoming), based on data from BBWFT (1997).

which tend to invest much more per apprentice and therefore retain a higher proportion of the apprentices they do train (Soskice, 1994; cf. Harhoff and Kane, 1997). Table 2, shows both sorts of figures between 1990 and 1995.

The data in Table 2 suggest that the reduction in firms' apprentice ratios has taken place at the same magnitude (roughly 20 per cent) across all size categories. The decline in the number of training places does *not* result from a disproportionate decline of the places (in the large firms) characterized by heavy net investment in apprenticeship training. Absent better data on which companies are training, and more particularly on how much they are investing in their training, the figures in Tables 1 and 2 together suggest that there has indeed been a reduction in western German apprenticeship training between the early and the late 1990s, but that it is the disproportion between firm places and youth demand for apprenticeship in the early 1990s that is the historical outlier. Nor does the decline bespeak a loss of employer confidence in the dual system. A poll of more than 800 firms having between 100 and 1,000 employees, undertaken by the Federal Institute for Vocational Training in 1996 and 1997, found that three-quarters of the firms surveyed were satisfied or very satisfied with the efficiency of the dual system as a means to cover their needs for skilled workers (BBWFT, 1998, pp. 126–32). There *are* problems from the perspective of these firms: the rising costs of apprenticeship in the 1990s (Wagner, forthcoming) led 35 per cent of them to characterize apprenticeship as too expensive, and

45 per cent expressed a desire to reduce apprenticeship wages; these are significant minorities, but they are still minorities (BBWFT, 1998, p. 127). By neither their own expressed preferences nor by the relationship of places they offer in comparison to the number of potential apprentices do these firms give evidence that the dual system can no longer function as the basis of the high-skill equilibrium in western Germany.

(ii) Eastern Germany

Eastern Germany, by contrast, is certainly not part of a self-sustaining high-wage, high-skill equilibrium in vocational training. The success by which the HSE is judged is the willingness of companies to make substantial uncovered investments in skill provision without state subsidies. Of the new apprenticeship places offered in eastern Germany in 1997, shown in Table 3, 79 per cent were either wholly or partly subsidized by federal or state government sources (BBWFT, 1998, p. 35). More than 10 per cent of these places (15,000) were created by governments, and they are not (as in western Germany) based on a work contract between an apprentice and a firm; they normally take place in school or training centre environments, and the apprentices who get these places lack the same exposure to productive work as their in-firm counterparts.⁸ In-firm apprenticeship places subsidized by the state governments constitute the bulk of the places in eastern Germany, as they have every year since unification. These places are governed by a work contract and apprentices are integrated into

⁸ The post-apprenticeship employment rates of these young people tend to be much lower than those of apprentices with firm-based training contracts, since in the former case there is no company that has had 3 years to evaluate their possibilities and groom them as future employees (Ulrich, 1995).

Table 3
Apprenticeship Training in Eastern Germany, 1992–7

Year	Apprenticeship places	Youth seeking apprenticeships	Places/Seekers (%) [*]
1992	98,000	96,000	102.1
1993	102,000	102,000	99.2
1994	119,000	119,000	99.9
1995	124,000	128,000	96.4
1996	126,000	138,000	90.8
1997	126,000	148,000	89.7

Notes: *Here and in Table 1, the figures on places and youth are rounded to the nearest thousand, whereas the percentages given in this column reflect the relation of the figures before rounding. N.B., as explained in the text, the number of apprenticeship places offered (second column) includes subsidized in-firm places and apprenticeship places in training centres that are not part of a firm contract. The figures are not, therefore, directly comparable with those in Table 1.

Source: BBWFT (1998).

the productive process of the company, but the employer receives a subsidy to help cover the costs of training; thus, the net employer investment in the costs of training is reduced.

The subsidized disequilibrium on the eastern German apprenticeship market simply mirrors the problems of the eastern German labour market: following the monetary union that instantly rendered eastern German firms non-competitive, one-third of the labour force was effectively unemployed by 1991 (Lange and Pugh, 1998). Wagner (forthcoming) estimates that a headline eastern German unemployment rate of 15 per cent in 1996 masked the *de facto* unemployment of discouraged job-seekers and those in government work creation schemes and further training, without which it would have reached 28 per cent of the work-force.⁹ Under these conditions, in which would-be apprentices have to compete with the deluge of unemployed skilled workers on the job market, many of whose hires could be subsidized by government programmes, it is hardly surprising that federal and state governments have chosen to subsidize apprenticeship offers by firms. What we do not know, because the experiment is unique, is whether or not these subsidies will facilitate the emergence of HSE-levels of investment in skill qualification through apprenticeship, or whether instead they will institutionalize

indefinitely a dependence on subsidies for a significant proportion of the apprenticeship market. Such an outcome would not only mean that the transfer of the dual system to the new federal states of eastern Germany had failed, but it would almost certainly be corrosive of employer investments in apprenticeship training in western Germany.

Large firms in eastern Germany, especially those with western German ownership, appear to invest in apprenticeship at levels consistent with the high-skill equilibrium (Culpepper, 1996). An IAB panel survey from 1996 found that very large firms were also the only size category in which a greater number of firms planned to increase rather than contract their apprenticeship training in the coming years (BBWFT, 1998, p. 137). One acute problem for the eastern German economy, as argued by Carlin and Soskice (1997), is the paucity of large private firms that can serve as the core of inter-firm networks for the encouragement of training and technology transfer. Conversely, it is small companies in eastern Germany that have the greatest difficulties engaging in training, citing the difficulty in meeting the broad requirements supervised by the chambers for apprenticeship training (von Bardeleben, 1995). The subsidies that appear to have been most successful in encouraging eastern German firms to begin investing heavily in apprenticeship training are those

⁹ Including commuters to jobs in western Germany and those in early retirement in this calculation, the rate would climb to almost 35 per cent of the eastern German work-force.

that facilitate training alliances among several firms (often anchored around one large firm), in which eastern German managers are able to learn about the benefits of these human capital investments while they also learn how the institutional system of western German apprenticeship supports training (Culpepper, 1998, forthcoming); all the new eastern states have now adopted subsidy programmes with this design (BBWFT, 1998). While the future of eastern German training is difficult to predict with any level of certainty, the fact that large, technologically advanced firms are leading the diffusion of the dual system eastward—rather than trying to use eastern Germany as a green field for relaxing the constraints imposed by the western German system of training—provides reason for guarded optimism on the part of advocates of the HSE.

IV. INSTITUTIONAL SUPPORTS OF THE HIGH-SKILL EQUILIBRIUM

The previous section has established that, as measured by current participation, neither firms nor individual young people are fleeing the dual system in western Germany *en masse*. The transition under way in eastern Germany is dominated by the weak labour market resulting from the restructuring of the economy, and it is too early to pass judgement on the future of the high-skill equilibrium there, though the training practices of large private firms are a positive sign for the eventual establishment of an eastern German HSE. However, section III only demonstrates that a snapshot view of the skills system does not show it to be in imminent crisis. The prognosticators of doom for the German skills model tend to point more at problems in the institutions that support the apprenticeship system, rather than the system itself, when seeking evidence for its erosion. In the next two sub-sections, I analyse the stability of the institutions that support the dual system: finance and the organization of production, and the organizations of the industrial relations system.

(i) International Convergence?

No current article in political economy is exempt from mentioning the nebulous ‘internationalization of financial markets’ that may or may not be changing the possibilities for institutional divergences in types of capitalism (Garrett, 1998). The causal

chain that would link internationalizing markets with a breakdown in the German high-skill equilibrium runs through the long-term perspective supposedly fostered by access to patient capital. If German firms must rely on international markets for capital, rather than their house banks, it follows that this bastion of long-termism would be eroded by a new emphasis on quarterly earnings reports. There is some evidence that German large firms during the 1990s have tried to liberate themselves from reliance on, and monitoring by, their *Hausbanken* (Lane, 1995; Streeck, 1997); there are also plausible theoretical reasons to think that the post-EMU functioning of European markets will put pressure on the cross-shareholding national structure that has largely protected German banks from the threat of hostile takeovers (Story, 1996). However, existing studies show that even though large firms are relying more than in the past on equity finance, ‘this does not mean that large German firms no longer have an environment supportive of long-term investment. On the contrary, large German firms are maintaining (if not actually increasing) their cross-shareholdings and interlocking directorates’ (Deeg, 1996, p. 15). The substantial body of firm surveys by the Federal Institute of Vocational Training and the National Employment Office in Germany supports this finding: none has discovered evidence that changing access to finance is affecting training practices of companies, nor have any case studies revealed this effect. The change in the German financial system may eventually have knock-on effects on the training behaviour of firms, but current research does not reveal a decline in the ‘long-termism’ of German industry.

There has been more work on the question of changes in the organization of production, because the links between this system and the training system are abundantly clear to every company manager. Innovations in organizing multi-functional production teams and facilitating ‘learning by monitoring’ in iterative loops of information exchange through lean production have allowed Japanese firms to out-compete their German counterparts in areas, such as automobiles, in which German incremental innovation (or DQP) was long regarded as a highly successful strategy for securing export markets (Womack *et al.*, 1990; Sabel, 1994). German manufacturers have tried to graft on to their production process features of the Japanese productive

model—notably the organization of work in teams and the flattening of hierarchies—but these changes have run up against other elements of the German political economy with which they have proved incompatible (Sabel, 1995; Streeck, 1996). The fundamental incompatibility is bound up in the apprenticeship-based skill model: the social identities of German skilled workers are inextricably embedded in their definition within an occupation, or *Beruf*. The organization of work in multi-functional (i.e. generalist) teams rejects the concept at the heart of the German skills system, that a skilled worker brings to the process a (portable) technical skill that is his or her contribution to production (Streeck, 1996; Herrigel and Sabel, forthcoming). German companies in a wide array of manufacturing sectors have begun to implement the innovations of the lean production model; the empirical question is whether or not the apparent incompatibility between the identity instilled by the *Beruf* and the introduction of teamwork can be overcome.

Finegold and Wagner (forthcoming) have tested the hypotheses raised by the clash between the *Beruf* and lean production in a recent matched-plant comparison of 36 German and American pump manufacturers. Two central findings emerge. First, they confirm that Herrigel and Sabel correctly delineate the politics of lean production: it is, indeed, skilled workers in Germany who most bitterly oppose the move to multi-functional teams, and they do so precisely because it threatens the contribution of their individual skill proficiency to the wider production process.¹⁰ However, some of the customized German producers in their study had succeeded in skirting this issue by increasing the responsibility of groups of skilled workers on the production floor without trying to impose a *Beruf*-blurring concept of multi-functional teams. These plants were able to flatten their organizational hierarchies by devolving significant responsibility to the teams and to already well-trained foremen (*Meisters*). Moreover, semi-skilled plants in Germany that moved towards team production *increased* their intake of apprentices in subsequent years because of the increased skill demands of team-based production. Though the

Finegold and Wagner study is a rigorous example of plant-level developments, it would be risky to generalize too broadly on the basis of these findings for one sector (in which heterogeneous outcomes were observed across different product segments). They at least demonstrate, though, the plausibility of a form of lean production that is able to reap the competitive advantages of the Japanese system without fundamentally challenging the German apprenticeship certification system. If plant managers in other sectors continue to view the acquisition of skills through apprenticeship as the best available way of responding to their skill needs for production, then the sustained company demand for apprentices is not threatened. The German apprenticeship system is indeed rigid and unwieldy, but as long as the value it delivers in skill provision outweighs the costs its skill hierarchies and occupational identities impose on designing production, firms will continue to use it.

(ii) Employers' Associations, Unions, and Industrial Relations

However, the value of the apprenticeship system to employers ultimately rests on the ability of employers' associations and unions to deliver the collective goods described in section II of this article. And it is in this context that the analytical distinction I have maintained between western and eastern Germany must fall away, because the empirical reality is that the two halves of Germany are now linked through the industrial relations system and the private-interest organizations that are responsible for the functioning of the apprenticeship system. In administrative and legal terms, these organizations have been transferred to eastern Germany successfully, in that they have assumed the official functions carried out by their counterparts in western Germany (Wiesenthal, 1995; Offe, 1997).¹¹ Unification has highlighted and exacerbated some already existing strains on these organizations (Silvia, 1997), and it has created new problems of its own for the entire German model (Streeck, 1997). As a result of these problems, the coordinating capacity of German employers has diminished since the mid-1980s.

¹⁰ By contrast, in the American plants studied by Finegold and Wagner, it is the plants with the highest concentration of skilled workers that had moved the *furthest* towards team production, since American skilled workers did not put their technical virtuosity at the centre of their professional identity in the same way that the German skilled workers did.

¹¹ Although this consensus masks a divergence of views on the question of whether eastern institutions function exactly as they do in the western part of the country; on this, see Henneberger (1993), Fichter (1997), and Offe (1997).

Whether or not the organizations will continue to be able to support the functioning of the skill provision system in its existing form, given their reduced capacity, depends largely on how accurate the original model of the high-skill equilibrium was in the first place.

Over the past decade, the growing problem of German employers' associations has been their difficulty in elaborating a common strategy that responds to the demands of both large and small member firms.¹² To simplify, large firms are willing to bear the high fixed costs imposed by wage bargaining with the unions, because their paramount concern is labour peace; small firms are more sensitive than their large counterparts to marginal increases in wages, and the degree of shop-floor union activity can be said to decrease with firm size (particularly as regards the activity of works councils) (cf. Streeck *et al.*, 1987). The difficulty in satisfying the increasingly divergent demands of the two groups is a major factor contributing to the decline of western associational density; in the metal-workers' group (*Gesamtmetall*, which is the most important sectoral employers' association), the rate of employment density fell from 74.5 per cent in 1984 to 64.2 per cent in 1993 in western Germany (Silvia, 1997, p. 193). The decision by western German union and employer representatives to pursue a rapid push to wage parity in the new eastern states after unification exacerbated the large/small divide in the new federal states. The largest firms, usually with western German ownership and access to finance, were more willing (and able) to accede to wage demands that far outstripped productivity gains than were small firms. The result was a loss of members for the eastern German association, and since the early days of unification the associations have had acute difficulty attracting new members (Ettl and Heikenroth, 1995). In 1993 the density of membership in eastern German affiliates of *Gesamtmetall* was 10 percentage points lower than in western Germany, including firms with just 53.9 per cent of the employment in the sector (Silvia, 1997).

As a result of their difficulty in attracting new members and retaining old ones, all the *Gesamtmetall* affiliates in the eastern German states have founded parallel associations that do not require members to

adhere to the negotiated wage deals signed by the association. In my interviews with representatives of these groups in Berlin and Brandenburg, Saxony, and Saxony-Anhalt in 1995, all reported membership stagnation in their 'wage-bound' associations, while most of their new members joined the non-wage-bound associations; in 1996, *Gesamtmetall* began recommending that its western German affiliates also establish such non-wage organizations. This trend certainly does not imply the imminent demise of collective bargaining in western Germany, which many large western German firms view as a continued positive attribute of the German model (Thelen, 1999). Just as clearly, though, the establishment of these organizations based on a model of service-provision, rather than as sources of protection from industrial conflict, represents a decline in the coordinating capacity of employers.

As we might expect in a political economy bedeviled by high unemployment, German unions and works councils have encountered even more organizational difficulties than employers' associations since German unification. Union membership in the east expanded dramatically in the early days of unification, but it then plummeted following the unremittingly bad news on the labour market (Fichter, 1997). In the long run, a dramatic change in the balance of power between employers and workers would have an impact on the viability of the high-skill model (through the causal mechanism traced in section II); but that is not a serious concern in the near-term. However, there is a growing tension between works councils and unions in eastern Germany (Hyman, 1996), as well as a similar strain on union-works council relations created by the greater introduction of lean production techniques in western Germany (Auer, 1997); this development poses a more challenging problem for the stabilizing architecture of the high-skill equilibrium. The successful division of labour (indeed, cooperation) between works councils at the plant-level and industry-level unions was a hallmark of the German industrial system of negotiated adjustment over the last three decades (Thelen, 1991). In eastern Germany, particularly, tension between works councils and unions has arisen in a period when the foremost concern of the works council is the survival of the plant, not the enforcement of a negotiated wage (which is the *raison d'être* of the union) (Fichter,

¹² The increasing importance of this political division has been identified and analysed by Silvia (1997).

1997). The close cooperation of the two organizations in the past has given unions a strong presence on the shop-floor while also bolstering the expertise of its members in negotiations to revise skill certifications. A conflict between the two creates the possibility for greater deviation of individual plant strategies for apprenticeship from those pursued in negotiation by the unions.

The dual apprenticeship system that underlies the German high-skill equilibrium is a negotiated system, and its resiliency will depend on the capacity of these groups to continue providing the collective goods they have delivered in the past. Up until now, this article has proceeded on the assumption that the ideal model of the high-skill equilibrium (delineated by Finegold and Soskice, and heavily influenced by the work of Streeck) constitutes an accurate analysis of German training. If it were entirely correct, then the organizational changes just described would represent a grave threat to the future functioning of the skill-provision system. Their high-skill equilibrium analysis requires a sanctioning capacity on the part of these organizations that these organizations no longer possess. For Finegold and Soskice, employers' associations must possess an informal sanctioning capacity in order to dissuade would-be poaching companies; Soskice (1994) adds the co-decision-making power of works councils in large firms as an additional barrier to poaching. Streeck is less impressed than Soskice by the organizational ability of capital to bind itself to the mast of cooperation (Streeck *et al.*, 1987; Streeck, 1992, 1996), but his model also requires a sanctioning mechanism: collective wage agreements supported by strong industrial unions to discourage poaching strategies, and works councils to provide *ex-post-facto* enforcement capacity for renegade firms. The weakening of employers' associations in the eastern and western parts of Germany has led to a situation in which they do not have a credible sanctioning capacity against member firms that choose poaching strategies (see Culpepper, 1996, for empirical support for this claim). The growing schism between works councils and unions weakens the *ex-post-facto* enforcement capacity described by Streeck; the negotiated wage agreements remain, in east and west, but the innovation of the non-wage-bound employers' associations represents a dark cloud on the horizon of skill provision in Germany, because their existence bespeaks a growing toleration for

deviations from the wage agreements (especially in eastern Germany). On its own terms, these organizational developments threaten the high-skill, high-wage equilibrium portrayed in different variants by Soskice and by Streeck.

However, if these authors have mischaracterized the underlying game of apprenticeship training in Germany, then the outlook for its continuation would be somewhat brighter. Finegold and Soskice's concept clearly builds on the structure of a prisoner's dilemma, in which the non-cooperative outcome (poaching) always has a higher pay-off in a single round of play than the cooperative outcome (investing in the training of your own apprentices) (Finegold and Soskice, 1988; Finegold, 1991; Soskice, 1994). However, if we take as given the basic premises of an existing high-skill economy like Germany's—characterized by the DQP-style organization of production, high negotiated wage structure (relative to competitors on international markets), and access to long-term finance—then the attraction of employers to low-skill workers is already considerably reduced. We only need to make defensible assumptions about employer preferences for apprentices trained in, say, the 'corporate' culture of his or her own firm to convert the structure of the game to an assurance game, in which the pay-off to mutual cooperation exceeds that of defection, provided everyone else cooperates. In such a game, the need is for institutions that can rapidly and effectively circulate information so as to achieve common knowledge. Despite their troubles, German employers' associations (in both halves of the country) retain a strong capacity for information-circulation and collective deliberation, one that is certainly not matched in the UK, the USA, or France. If the nature of training less resembles a prisoner's dilemma, and more resembles an assurance game, then the organizational problems sketched above do not comprise an incipient crisis in the high-skill, high-wage equilibrium. We can only know how much trouble the HSE is in if we know which assumption is closer to the truth.

V. LOOKING BEYOND THE MODEL TO THE FUTURE

The tone I have adopted in this article, with respect to the viability of the high-skill equilibrium in Ger-

many, is relatively upbeat. However, this assessment has started from theoretical premises—‘what might threats to the German high-skill equilibrium look like?’—and then adduced evidence that, with the exception of developments in the system of industrial relations, there is little empirical support for any of these potential threats. The decline in apprenticeship places in western Germany in the 1990s, seen in historical perspective, seems to be more a business-cycle-dictated re-equilibration than a secular decline. The globalization of equity finance has not curtailed the German practice of cross-shareholding and interlocking directorates, and no finance-driven degradation of long managerial time horizons is apparent in German firms. The spread of lean production techniques does challenge the occupationally centred German apprenticeship system, but German firms in at least one sector have been able, with some success, to adapt elements of lean production to a skilled work-force built around occupational identities. There are real problems in the changing architecture of the industrial relations system: most saliently for skill provision, a declining capacity of employers’ associations to discipline their members, coupled with growing tension between the unions and works councils in coordinating *ex-post* supervision of company compliance with HSE practices in the domain of training. This is a threat to continued high investment in apprenticeship training in Germany, but the severity of the threat is sensitive to questionable assumptions about the nature of the training ‘game’ for firm managers embedded in a high-wage system.

In short, the balance of the evidence weighs against the proposition that the skills system is in imminent danger from the deterioration of the core institutions of the German high-skill equilibrium. However, if we allow a little more real-world complexity to enter the picture, there are some pressures for change whose consequences for the HSE model are not easily anticipated. Perhaps the most glaring new trend is the rising importance of jobs in the service sector; it is these jobs, not those in the manufacturing sectors, that are now the engines of job growth across the OECD countries (Hall, 1998). There are far fewer service profession certifications in the dual system than there are in manufacturing occupations, and it is an open question (one that cries out for further research) whether service-sector companies will be able to derive the same competitive

advantages from the system as manufacturing companies have in the past. One development that companies in the service sector have been leading is the growing importance of further training measures in Germany. Data from firm surveys indicate that the growing demand for further training in companies has not come at the cost of apprenticeship, but in addition to it (BBWFT, 1998). Yet the German further training system is far more flexible than the rigid apprenticeship system; it is imaginable that the growth of the market of further training providers, and measures to establish recognized standards, may eventually sap the interest of company managers in adhering to the rigid, sometimes dated requirements imposed on them by apprenticeship regulations. Either one of these developments would have effects analogous to those discussed in section II about the fit between the organization of production and the skills system; but developments in this direction are uncertain, and it can only be indicated as an area of potential concern.

The increasing importance of further training and the rising clamour for more passageways between vocational training and the post-secondary educational system will eventually put pressure on the social compromise that is the heart of the post-war German model. The effect of the apprenticeship system in this model has been to supply the certifiable vocational skills to a large proportion of the youth population, which (in combination with a highly stratified educational system) has limited the general occurrence of ‘downward’ class mobility, but which also limited ‘upward’ mobility (Hinz, forthcoming). Breaking down the barriers between the vocational and university systems will de-stratify the educational system, but the greater resort to further training will very likely exacerbate the inequality of incomes in Germany. Access to further training tends to reinforce, rather than ameliorate, skill differentials: managers in Germany receive disproportionately more further training than front-line workers, and both women and older workers have markedly lower access to further training than their (respectively) male and younger counterparts (Finegold, forthcoming; Gatter, forthcoming). It is easy to imagine that the German skill provision system could overcome the divide between post-secondary and vocational education, and the low existing levels (in international comparisons) of further training. But the consequences of these

changes for levels of inequality may aggravate the problems of an already over-stretched welfare state, and they are very likely to exacerbate the insider–outsider character of the German political economy.

Do these changes mean that the German apprenticeship system is in crisis? Probably not. But they underline that the German skill provision system is becoming institutionally more heterogeneous than the simple, apprenticeship-dominant model of the high-skill equilibrium implies. Because many of the admirers of the high-skill equilibrium have argued for its superiority at least in part by virtue of its presumed capacity to create more equitable social outcomes, the growing role of these other elements of skill provision should temper the optimistic portrait of German apprenticeship that emerges from

this article. My analysis has shown that the institutional supports of the high-skill equilibrium are not teetering on the brink of collapse. German companies are not abandoning apprenticeship, but they are supplementing it in order to respond to the more rapid pace of change imposed by their product markets. The institutions they devise to complement the intermediate skills conferred by apprenticeship are still under construction, but they may turn out to produce outcomes at variance with the political compromise by whose lights the high-skill equilibrium produces acceptable social outcomes. The HSE has weathered the introduction of lean production and the globalization of finance, and it seems a good bet to weather the trauma imposed by German unification; the question for the future is whether it will be politically sustainable if it becomes a culprit in the growth of inequality in Germany.

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