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Trainee Pay in Britain, Germany and Switzerland: Markets and Institutions

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Abstract

Trainee pay plays an important role in the economics of training, but how it varies across time and place is not well understood, neither in terms of both processes (pay setting) or outcomes (pay rates). This paper draws on a research project on initial training, specifically apprenticeship, in two sectors (metalworking and retailing) in three countries (Britain, Germany, and Switzerland). Germany excepted, apprentices are less often covered by collective bargaining than are regular employees and other trainees, but they are frequently paid performance-related bonuses in all countries. The pay of trainees (relative to that of skilled employees) is low in Switzerland, middling in Germany, and high in Britain, and higher in retailing than engineering. These differences are associated with: the content of training and pay differentials by skill; the age of trainees; the nature of training contracts; collective bargaining coverage; the appeal of apprenticeship to young people; public subsidies; and monopsony power. The high pay of trainees in Britain is attributed primarily to supply shortages, and, in retailing, to low and uncertain training standards. The low pay of apprentices in Switzerland reflects the low age of entry to training, restricted access to full-time upper secondary education, and probably also the power of employers in the training market. Trade unions should not be viewed as generally seeking higher pay for trainees, leading to wage compression.

1. Introduction

Trainee pay plays a key role in the economics of training. It determines how the costs of work-based training are divided between the employer and the trainee: given the content of training, the lower trainee pay, the greater the share of the cost borne by the trainee. Economic models of training typically assume that trainee pay is set competitively, to clear supply and demand in the market for training places, and predict that, the more the skill to be learned, the lower the pay of trainees. Other models allow a limited role for collective bargaining.[1] So narrow a range of assumptions cannot do justice to reality, and the relevance of the models' predictions may be correspondingly limited. In particular, imperfect competition may affect trainee pay as well as skilled pay, which may lead in turn to 'production-oriented' training and the exploitation of trainee labour.[2] Trainee pay may also depend on such institutional attributes as the nature of training contracts and labour market structure.[3]

This paper explores how trainee pay is determined and how outcomes differ across countries and sectors. We focus on initial training in general, and apprenticeship training in particular, in three countries – Britain, Germany, and Switzerland – and two sectors – engineering (or metalworking) and retailing. Our choice of countries and sectors reflects the marked differences between them in institutions and outcomes. Trainee pay is higher in Germany than in Switzerland, but higher still in Britain; in all countries, it is higher (relative to non-trainee pay within the sector) in retailing than in engineering.

The issues include the following. In terms of process, how widespread is the coverage of trainee pay by collective bargaining and performance-related pay? In terms of outcomes, what is the effect of collective bargaining on trainee pay – in particular, do trade unions invariably seek higher pay for trainees, thereby causing 'wage compression'? Comparisons of training costs in Germany and Switzerland have suggested that greater collective bargaining coverage causes higher apprentice pay in Germany (Dionisius et al. 2008). Can that line of explanation be extended to high trainee pay in Britain? And might the exceptionally low pay of Swiss apprentices be caused by more than trade union weakness?

[1] Stevens (1994a), Acemoglu and Pischke (1999).
[2] Wolter and Ryan (2010).
[3] Marsden and Ryan (1991a), Wagner (1999).

Evidence is taken primarily from fieldwork research, based primarily on face-to-face interviews with the managers of 56 companies spread across the three countries and two sectors (Ryan et al. 2010). The next section discusses the role of trainee pay in economic models of training. Section three outlines the relevant training systems; section four and the Appendix, the research methods used in the fieldwork; section five, methods of pay setting; section six, pay outcomes. Section seven analyses the determinants of the pattern of trainee pay, followed in section eight by the conclusions.

The high pay of trainees in Britain is attributed primarily to shortages in the supply of young people acceptable to employers and, in retailing, to low and uncertain training standards. The low pay of Swiss apprentices is attributed to trainee youthfulness, rationing of access to full-time education, and the market power of employers, in addition to trade union weakness. The fact that apprentice pay in Germany is only middling despite high bargaining coverage suggests that unions should not be assumed always and everywhere to seek higher pay for trainees relative to skilled employees.

2. Economics of Trainee Pay

In human capital theory, trainee pay is determined by market forces. Models of perfect competition, assuming that skills are general, predict that the entire cost of training is borne by the trainee.[4] Were the firm to pay its trainees more than their marginal product during training, its investment could not be recouped by paying skilled workers less than their marginal product: competing firms would 'poach' them, offering to pay them their full marginal product (Becker 1964). Trainees therefore pay all the costs of training, whether as fees or as foregone earnings. In the absence of fees, the greater the cost of training, the lower is trainee pay.

However, the prediction that training costs are borne entirely by trainees conflicts with evidence that employers commonly incur costs for general training.[5] That anomaly has been explained by models of training that assume imperfect (monopsonistic) competition for skilled workers, who consequently do not all quit despite being paid less than their marginal product. The resulting surplus provides the

[4] The assumption of perfect competition can apply only when skills are general: i.e., equally productive when used by any one of many employers.
[5] Notably surveys of apprenticeship training in Germany (e.g., Beicht, Walden and Herget 2004).

firm with the required return on its investment during the training period. Moreover, the firm *must* incur part of the cost, as potential trainees, knowing they will obtain only part of the return, accept a training place only if the firm bears a share of the cost that corresponds to its share of the return, i.e. the firm has to pay trainees more than it would in perfect competition. So the trainee's marginal product increases over the training period by more than does pay – a situation termed 'wage compression'. The potential sources of monopsony power over skilled labour include fewness of buyers (caused by heterogeneous skill requirements) and informational asymmetries between employers about the attributes of individual workers or training programmes (Stevens 1994a; Acemoglu and Pischke 1999).[6]

A further feature of these models is that, although the market for skilled labour is assumed monopsonistic, perfect competition is usually assumed for the market for training places. The assumption is explicit in some models.[7] One variant assumes an exogenous, supra-competitive wage floor for trainees, caused by collective bargaining or minimum wage law, which increases wage compression and the incentive to the employer to offer training (Acemoglu and Pischke 1999).[8]

However, a combination of monopsonistic competition for skilled workers with either perfect competition or a wage floor for trainees is unlikely to provide a widely appropriate set of assumptions about training-related market structure. Two alternatives are potentially important. First, collective bargaining and statutory wage regulation may affect outcomes for skilled workers or trainees, or both. For example, where trade unions negotiate trainee pay, they may not seek to raise it above the competitive level. The influence of trainees, as a minority interest group within the membership, may be too weak for any interest in higher pay on their part to influence the union's bargaining objectives. Alternatively, the union's leadership may wish to avoid damaging the supply of training places by raising the price of trainee services –

[6] Some evidence suggests that employers bear *all* of the cost of work-based training, and trainees none (Barron, Berger and Black 1997). That finding applies to continuing (in-service) training, which dominates US micro data sets. It does not apply to apprenticeship, in which, even in the US, reduced pay scales typically apply over a training period with a fixed duration.

[7] E.g. 'free entry at the start of period 1 makes that w1 [trainee pay] is set such as to drive expected profits to zero' (Leuven 2005: 97) and 'suppose (for simplicity) that the training market itself is perfectly competitive ...' (Stevens 1999: 21). See also Chang and Wang (1996 : 509).

[8] Stevens (1999) shows however that an increase in monopsony power over skilled (relative to unskilled) labour increases the firm's supply of training only when potential trainees are financially constrained from taking training at the market-clearing pay rate.

as is particularly likely when the external regulation of training at the workplace standards prevents employers from using trainees as cheap labour.[9]

Second, the market for training places may involve monopsony power, as well as or instead of that for skilled labour. The generic sources of monopsony power, such as the search and matching frictions associated with the costs of information and mobility, apply in principle to trainees as well as skilled employees.[10] Some sources of monopsony power potentially affect trainees more than skilled workers, including age-based differences in individuals' stocks of labour market information and geographical immobility, caused by dependence on the parental household.[11]

Moreover, the firm's predicted training decision may be sensitive to assumptions about market structure. If monopsony power is assumed to be greater for trainees than for skilled workers, 'wage decompression' is expected: i.e. pay grows *more* than marginal product during the training period. Although no formal model of this scenario has been developed as yet, low trainee pay might be expected to orient employers toward 'production-oriented' training, using trainees to reduce current production costs, rather than the 'investment-oriented' training, using trainees to increase future skill supply, that is predicted by mainstream economic models.[12]

Finally, some institutionalist interpretations of trainee pay emphasise the distinction between training and employment contracts, and the link to labour market structure. When training involves a clear distinction between trainees and employees, both contractually and in production, along with the effective external regulation of training standards, employees are protected from the threat that their labour will be substituted by that of trainees, and are correspondingly more willing to accept training programmes that involve low trainee pay. Apprenticeship training potentially satisfies those conditions. By contrast, when trainees are themselves regular employees and firms' training programmes are not externally regulated, employees enjoy no such safeguards, and may push for trainees to be paid the 'rate for the job', with no pay

[9] Ryan (1987), Marsden and Ryan (1991b), Dustmann and Schönberg (2010).
[10] Boal and Ransom (1997), Manning (2003).
[11] Other sources of monopsony power are potentially more important for skilled workers, including heterogeneity of employers' skill requirements; and trainees, particularly young ones, may enjoy more freedom than skilled adults to pursue alternatives activities, including full-time education and leisure. Indirect evidence of monopsony power over trainees comes from the effectiveness of collective action by apprentices in British engineering in the last century (Ryan 2010b).
[12] Mohrenweiser and Zwick (2009), Backes-Gellner and Mohrenweiser (2010), Wolter and Ryan (2010).

reduction during training.[13] The former is associated with occupational labour markets, and the 'regulated inclusion' of youth at the workplace; the latter with internal labour markets, and the informal exclusion of youth from the workplace (Garonna and Ryan 1991, Marsden and Ryan 1991a).

3. Attributes of National Training Systems

What is the relevance in practice of these alternative assumptions about trainee pay setting? The issue is considered for initial training in general, and apprenticeship in particular. 'Apprenticeship' is taken to denote training programmes that combine vocational education with work-based learning for an intermediate occupational skill (i.e., more than routinised job training), and that are subject to externally imposed training standards, particularly for their workplace component. Evidence to do with apprenticeship has motivated the development of economic models of training in imperfect competition.[14]

Three countries are studied, all of which have substantial systems of apprenticeship training. Germany and Switzerland occupy the top places in international league tables for individual participation in apprenticeship, with around two-thirds and three quarters of the youth population cohort respectively taking one.[15] By contrast, Britain[16] has a lower participation rate, which the government hopes to raise to one-fifth (DUIS 2008: 5).

Measuring the scale of apprenticeship is straightforward for Germany and Switzerland, where national legislation defines apprenticeship and provides for the setting of high training standards. The absence of any comparable statutory framework means that in Britain apprentices cannot be clearly distinguished from other trainees and employees.[17] By default, the standard criterion of apprentice status is participation in the Apprenticeships programme, through which government funds

[13] The absence of any significant trainee share of training costs in most US microdata (Barron et al. 1994) is consistent with the predominance of unregulated informal training in the US (Ryan 1984).
[14] Stevens (1994b), Franz and Soskice (1995), Acemoglu and Pischke (1998).
[15] The participation rate in Germany averaged around 67 per cent during 1992-2009, falling below 60 per cent only in 2005 (BIBB 2010, Fig 2: 21); the Swiss rate averaged around 75 per cent during 1981-2007, never falling below 70 per cent (SKBF/CSRE 2010, Fig 93: 143).
[16] Strictly speaking 'England', as the British establishments in our sample all operate primarily (retailing) or entirely (engineering) there. As Scotland and Northern Ireland operate their own public training programmes, our data for Britain refer mostly to England, either alone or in conjunction with Wales.
[17] The 2009 Apprenticeship Act focuses on the Apprenticeships programme rather than generic apprenticeship (Parliament 2009).

most work-based learning for young people. As the content of employers' training programmes must conform to a 'framework' stipulated by a Sector Skills Council in order to receive public funding, the criterion is potentially useful for counting 'apprentices' in Britain (Ryan, Gospel and Lewis 2007).

Even so, as training requirements vary greatly in Britain across frameworks, occupations and sectors, the question arises: how widely should the net be cast when counting Apprentices? The option chosen here is to include only Level 3 ('Advanced') Apprentices, for which – in industrial occupations at least – skill standards are comparable to those in German and Swiss apprenticeship.[18]

As Table 1 shows, apprenticeship operates on a much larger scale in Germany and Switzerland than in Britain. Taking the economy as a whole, the number of apprentices amounts to 6.5 and 4.8 per cent of the number of employees in Germany and Switzerland respectively, but only 0.7 per cent in Britain.

Does the same apply to engineering and retailing? International comparisons at sector level are complicated by mismatch between the occupation categorisation of training data and the sectoral basis of employment data, but the problem is not expected to differ greatly between the countries. In engineering, the apprentice ratio in Britain (5.9 per cent) is comparable to that in both Germany and Switzerland (5.8 and 4.9 per cent, respectively).[19] The gap between training rates in Britain and the other two countries is however large in retailing: an apprentice ratio of nearly eight per cent in both Germany and Switzerland, as against only 0.3 per cent in Britain. The difference between England and the other countries reflects the widespread preference of English retailers for informal on-the-job training rather than Apprenticeship.

The national apprenticeship systems differ also in content. In both Germany and Switzerland, apprentices spend between one and two days a week in formal education at a vocational college. In Britain, the same applies to engineering Apprentices, most of whom spend their first nine months entirely off the job, in

[18] Ryan and Unwin (2001); Steedman and Wagner (2003); Mason and Wagner (2005): Ryan, Gospel and Lewis (2007). The alternative is to include Level 2 Apprentices, but their training is typically aimed below intermediate (craft, technician) skill level, and most Apprentices, particularly at Level 2, receive little or no part-time vocational education in public colleges, a standard ingredient in the German and Swiss systems.

[19] The British ratio rises to 11.7 per cent if Level 2 Apprentices are included, but that figure is misleading, given the limited content of Level 2 programmes compared to apprenticeship in the other countries. Level 2 Apprenticeships resemble *Anlehre* and *Attestausbildung* ('elementary apprenticeship') programmes for low achievers in Switzerland, taken by around 3 to 4 per cent of secondary-level graduates.

colleges and training workshops. But it does not apply to Apprentices in new training occupations, primarily in the service sector, who spend little time away from the immediate job, and who rarely receive any continuing education, vocational or general.[20] The difference from German and Swiss practice reflects the 'competence revolution' in British vocational qualifications, which downgraded technical knowledge relative to practical, job-related skills (Wolf 1995; Steedman 1998).[21]

Table 1: Apprenticeship activity by country and sector

			Number of apprentices ('000)	Number of employees ('000)	Apprentice-employee ratio[a] (%)	Including Level 2
GB[b]	2007	Whole economy	161.5[c]	23,073	0.7[c]	1.8
		Engineering	34.5[c,d]	826.5[e]	5.9[c]	11.7
		Retailing	14.2[c,d]	2,372.6	0.3[c]	1.7
DE	2007	Whole economy	1,781.6	27,224	6.5	n.a.
		Engineering	230.8	3,964.0	5.8	n.a.
		Retailing	159.8	2,016.8	7.9	n.a.
CH	2008	Whole economy	194.3	4,017.1	4.8	n.a.
		Engineering	18.1	368.9	4.9	n.a.
		Retailing	26.0	332.5	7.8	n.a.

Sources. See Ryan et al. (2010), Table 8.
Notes.
n.a.: not applicable.
[a] Employment is defined as excluding apprentices in all countries.
[b] England only.
[c] Advanced Apprenticeship (i.e., Level 3 programmes) only.
[d] Estimated on the assumptions that (i) the shares of different training frameworks in total participation are the same as in October 2004 and (ii) the breakdown between Level 2 and Level 3 Apprenticeship within frameworks is the same as that for programme leavers in 2004-05.
[e] 'Employment jobs' in scope to SEMTA, 2007.

4. Fieldwork: Scope and Method

Evidence is taken principally from face-to-face interviews with senior managers, mostly in the human resource/personnel function, in 56 establishments in two sectors

[20] One-third of all Apprentices (Levels 2 and 3 combined) claim to receive no off-the-job training. Time spent in off-the-job training averages between one and four hours per week in most service sector Apprenticeships, with Retailing and in Customer Service at the one hour end of the spectrum (Ullman and Deakin 2005: 3, 15).
[21] The Apprenticeship programme differs from its Germanic counterparts also in centring on: (i) public subsidies to a range of training providers, many of them for-profit organisations, not just public colleges; and (ii) contractual relationships and external inspection, rather than administrative hierarchy, social partnership and peer monitoring (Lewis and Ryan 2009; Ryan 2010).

– metalworking (in English parlance, 'engineering') and retailing – and three countries – Britain, Germany, and Switzerland. As far as possible establishments were matched across the three countries by products (as indicated by four-digit SIC code) and were differentiated by bargaining coverage and corporate ownership, the principal foci of the research.

In engineering, the sample is dominated by producers of pumps, turbines, and compressors, subsectors for which comparable manufacturing establishments could be identified in all three countries; in retailing, by a mixture of single department stores and chains that sell food, shoes, electronic products, or furniture. In both sectors, several establishments are owned by a foreign company, and several have a common parent.

The distribution of initial training across cases is skewed. In Germany and Switzerland all but one of the establishments operates Apprenticeships; in Britain, all of the engineering establishments but none of the retailing establishments do so.[22] For British retailing, therefore the focus instead is on initial training for sales staff, which in all cases involves an in-house bespoke training programme for newly hired sales staff.

Information is supplemented by interviews with national employers' associations, trade unions, public agencies, and other interested organisations. The interviews were conducted between April 2008 and May 2009, i.e. during the intensification of the recession induced by the international financial crisis. Further details are provided in the Appendix.

5. Trainee Pay Setting

Institutions of pay setting vary considerably across the three countries. This section focuses on two procedural issues: the influence of employee representatives, and performance-related pay.

Although only a minority of employees are union members in all three countries, collective bargaining covers a majority of employees in Germany, around one half in Switzerland, but only one third in Britain (Table 2). Bargaining external to

[22] Two of the British retailers actually offer Apprenticeships but they do so only outside the establishment or region covered by our fieldwork.

the establishment dominates in Germany (under the *Tarif* system);[23] bargaining internal to the company, in the other two countries.[24]

Table 2: Union membership and collective bargaining by country, 2007

	Union membership density[a] (%)	Collective bargaining coverage (%)
Britain	29	35
Germany	20	63
Switzerland	19	48

Notes.
Density: net union membership as percentage of wage and salary earners in employment.
Coverage: share of employees covered by a wage bargaining collective agreement as percentage of all wage and salary earners in employment who have a right to bargaining coverage.
Source. *ICTWSS: Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts in 34 Countries between 1960 and 2007*, AIAS, University of Amsterdam (www.uva-aias.net/208).

In the absence of national data on how trainee pay is determined, the sample of establishments is used (Table 3). In engineering, in all three countries most establishments are covered by a collective agreement for production employees, whether at plant, company or sector level (column 1). In retailing, bargaining coverage is widespread in Germany, but rare in Britain and Switzerland. Moreover, in Britain and in Swiss retailing, the collective agreements are all internal (at establishment or company level), but all external (at sector-region and sector respectively) in Germany and in Swiss engineering. In Switzerland, none of the relevant collective agreements cover pay, which is left to the employer to settle (ASM 2006: Art 15.2).

Negotiations for employees are rarely accompanied by negotiations for apprentices (Table 3, column 2). In only 17 of the 32 establishments with an agreement for employees does that agreement (or a separate one) cover apprentices' pay. Bargaining coverage of apprentices is wholly absent from the Swiss sample, including all of the nine firms with an agreement for employees. That is perhaps not surprising, given that in the Swiss establishments bargaining for employees does not cover employee pay. More striking is British engineering, where bargaining for

[23] In 2007, the pay of 83 per cent of German employees was covered by a collective agreement, directly or indirectly; only 7 per cent of employees were covered by company-level agreement. The corresponding figures for engineering (machinery, equipment) and retailing (distribution and repair) were 89 and 76 per cent respectively (IAB-Betriebspanel, 2007).
[24] Fluder and Hotz-Hart (1998), Kersley et al. (2006), Haipeter (2009).

employee pay occurs in six out of eight establishments, but for apprentice pay in none. Taking the sample as whole, 15 establishments are covered by an agreement for employees' pay but not for apprentices' pay.

Table 3: Union recognition, minimum wages and trainee pay setting, sample data

Number of establishments with attribute

		(1) Trade union recognition[a]	(2) Setting of trainee pay	(3)	(4)	(5) Number of companies[e]
			Negotiated[b]	Affected by minimum wage[c]	Same pay raise as employees[d]	
Engineering	GB	6	1	0	6	8
	DE	7	7	n.a	8	8
	CH	6	0	n.a.	0	8
Retailing	GB[f]	1	1	6	9	10
	DE	9	8	n.a.	9	10
	CH	3	0	n.a.	0	10
Total		32	17	6	32	53

Notes
[a] A collective agreement sets pay or non-pay outcomes or both for production (engineering) or sales (retailing) employees.
[b] At establishment, company or higher level.
[c] Pay of apprentices (or sales trainees) has been influenced in any way by changes in a statutory minimum wage.
[d] Same percentage increase at same time as regular employees in same occupation.
[e] Companies providing information on all three variables.
[f] Trainee sales employees.

Regulation of trainee pay by law occurs primarily in Britain, with its statutory minimum wage (column 3).[25] As a lower wage sector than engineering, retailing is particularly affected. Six out of the ten British retailers report that recent changes in the National Minimum Wage have increased the pay of sales trainees, and either raised pay structure as a whole or reduced pay differentials between trainee and experienced employees.[26]

Whether they are covered by a collective agreement or not, trainees may be included in their employer's general pay raises. That is the case in most (32 out of 53) establishments overall, including in Britain most of the establishments (11 out of 16)

[25] The only other instance is Ticino, a canton whose laws stipulate minimum apprentice pay rates. None of the establishments in our sample is based there.
[26] A further legal constraint on apprentice pay setting is the German requirement that firms who opt out of *Tarif* (sector-level) bargaining pay their apprentices at least 80 per cent of the relevant *Tarif* rate (Beicht 2006). The two such firms in that category both pay their apprentices less than *Tarif* rates but in neither is the legal floor a binding constraint.

in which trainee pay is not negotiated (column 4). However, no Swiss establishment, unionised or not, in engineering or retailing, includes apprentices in its general pay rounds. Indeed, several companies increase apprentice pay only intermittently, seeing no reason to give their apprentices an increase just because they are giving their employees one.

A further potential influence on apprentice pay is employee representation at the workplace, as notably in Germany, where works councils hold statutory powers to co-determine particular attributes of work-based training. The lower incidence and lack of powers of consultative bodies in Britain and Switzerland might be expected to mean sharp national differences in relation to apprentice pay setting.[27]

Table 4 shows that most establishments in the sample (36 out of 50) have some form of employee representation, whether at the workplace or at company level. The highest incidence is in Germany (16 out of 18); the lowest in England (seven out of 14). Where such bodies exist, managers see them as influencing trainee pay in only one quarter of companies (nine out of 36 overall), and in none in Switzerland. The incidence of such influence is highest in retailing in Britain, where all five companies report it, consistent with the status of trainees as regular employees not apprentices, and with most of these companies' adoption of representative councils instead of trade unions for communication with employees.

The limited influence of works council on apprentice pay in Germany is consistent with the statutory barrier to their handling pay-related issues, but managers explain it in terms of lack of interest. In some cases that applies to apprentice-related issues in general; but in six cases, the works council has expressed concern about non-pay issues, notably training volume, training content and post-training retention.[28] Managers interpreted low interest either in organisational-political terms – a low rate of involvement of apprentices in the consultative body itself – or in substantive terms – more concern from works councillors about the volume and content of apprentices'

[27] In Britain and Switzerland, statutory requirements for employee representation are respectively limited (European Works Councils in multinationals) and zero (a right for employees to elect workplace representatives, but no obligation to do so). Workplace representation is therefore limited to any consultative bodies that the company sets up.

[28] We encountered two cases of German works councils that press for all completing apprentices to receive an employment contract, two that press for larger apprentice intakes, one that seeks a lower intake, and one (in retailing) that wants to see all two year apprentices have the option of proceeding to a third year of training.

training than about apprentice pay, and little concern about pay among apprentices themselves.

Where collective bargaining and works councils do not influence apprentice pay, management decisions may be influenced by external pay norms. Thus pay setting for Swiss apprentices is coordinated informally by two institutions: first, cantonal training offices (*Berufsbildungsämter*), public bodies responsible for supervising apprenticeship in the locality; second, occupational associations (*Berufsverbände: BV*), private bodies responsible for the content of training and the assessment of apprentices in designated occupations.[29] BVs recommend apprentice pay schedules for their occupations, and investigate cases of conspicuous underpayment.[30] The extent to which their recommendations influence employers is not easily determined. However, an official of a large cantonal office states that, while employers do not have to adopt BVs' recommendations, more than 80 per cent do so.

Table 4: Workplace representation and training attributes in sample establishments

		Presence of consultative mechanism[1]	Influence on apprentice pay[2]	Adoption of policies toward non-pay issues[3]	Number of companies[4]
Engineering	GB	2	1	0	5
	DE	8	0	2	8
	CH	8	0	0	8
Retailing	GB	5	5	0	9
	DE	8	1	2	10
	CH	5	0	0	10
Total		36	7	4	50

Notes
[1] Works Council (Betriebsrat or Personal-Kommission), employee forum or other consultative body.
[2] Has any influence on apprentice (in English retailing, trainee) pay, at establishment or company level.
[3] Advocates changes in any non-pay attribute of the company's apprenticeship programme.
[4] Companies providing information on all three variables.

[29] Each of the more than 200 training occupations has a *Berufsverband*. Little evidence exists on the composition of the associations, described officially as 'organisations of the world of work' (Field and Grubb 2009; BBT 2010). In practice, most, including those handling occupations in metalworking and retailing, appear to be employers' associations.
[30] At least some cantonal offices (including Zurich) collate data on apprentice pay, whether actual (the average in recently registered training contracts) or BV-recommended. Some trade unions and occupational bodies (e.g., KV Schweiz for retailing apprentices) formulate and publish their own pay recommendations. However, the largest BVs for engineering (Swissmechanic) and retailing (Bildung Detailhandel Schweiz) appear not to publish their pay recommendations.

Most of the managers who describe themselves as free to set apprentice pay without other external constraints, notably in Britain and Switzerland, use benchmarking: obtaining data from an employers' association (British engineering) or a *Berufsverband* (Switzerland) on the distribution of apprentice pay in their sector or district and choosing a particular position in the distribution. Among the managers in our sample who said they do so, the preferred position was in the middle or the upper half of the distribution. The latter included a large German discount food retailer, which pays apprentices well above *Tarif* rates in order to obtain high effort and attract potential future managers.

Bonus pay

Managers often seek to motivate staff with performance-related pay, but is that the case for trainees as well as employees? As trade unions often oppose the use of incentive pay, is its use for trainees less common in unionised establishments, and therefore in British and Swiss establishments than in German ones?

In the absence of nationally representative data, the sample shows that trainees receive performance bonuses in a majority of establishments (32 out of 55; Table 5). Performance is measured at the level of the individual, the group, or both. Individual and group schemes are encountered with similar frequency. Group schemes typically cover not just trainees, but also other employees, as in the case of bonuses based on storewide sales in retailing. Individual schemes are particularly widespread among Swiss engineering firms, most of whom pay them to apprentices, whereas few British and German ones do so. (The use of group schemes is similar across the three countries). In retailing, only a minority of companies pay individual bonuses to trainees – primarily electrical and shoe retailers, who typically pay apprentices, like sales employees, commission on their own sales.

The bonus criterion involves performance at the workplace in all of the establishments that pay individual bonuses, i.e. none pays bonuses for performance in vocational education alone. At the same time, most of the systems with an individual component (seven out of 11) include a school-based contribution, based typically on examination performance, sometimes as part of a wider appraisal of the apprentice's progress. These cases are mostly in Swiss engineering.

Table 5: Incidence of performance-related pay for trainees in sample establishments

		Number of companies paying bonuses to any trainees[a]				Performance criteria (individual bonuses)			Number of companies
		Individual	Group	Both	Either	School only	Workplace only[b]	Both	
Engineering	**GB**	1	5	1	5	0	0	1	9
	DE	2	4	2	5	0	1	1	8
	CH	6	4	4	6	0	1	5	8
Retailing	**GB[c]**	3	4	2	5	0	3	0	10
	DE	2	3	0	5	0	2	0	10
	CH	4	2	0	6	0	5	0	10
Total		18	22	9	32	0	12	7	55

Notes: apprentices in all categories except British retailing (trainee sales staff).
[a] Apprentices often become eligible only after a specified period (e.g., after the first year of training).
[b] Includes commission pay in retailing.
[c] Sales staff during the first months of employment.

Where apprentices receive bonus pay, the formula often differs from that for employees. Engineering companies tend to exclude apprentices in the first phase of training, which is in all countries spent outside production. Other firms pay lower bonus rates to apprentices. One German shoe retailer sets the weekly sales level required for eligibility for bonus pay higher for apprentices. Other firms pay apprentices the standard bonus rate, but note that the time apprentices spend off the job and their inexperience mean lower bonuses.

Of the 23 companies that do not pay bonuses to trainees, eight pay bonuses to employees in the same occupations. The principal reason for excluding trainees is a perceived status difference between apprentices and employees, as learners and producers respectively. Some managers want to avoid conflict between the learning of skills and the increased pressure to produce that bonus pay causes; by contrast, others pay bonuses because they wish apprentices to learn to handle the same pressure.

The use of bonuses is not systematically associated in the sample with either union presence or country. There were cases of effective union opposition to bonus pay, including a British pump manufacturer's reason for withdrawing a scheme only one year after setting it up. But there is no substantial difference between the share of unionised and non-union establishments that pay bonuses to apprentices (or skilled employees).[31] Similarly, the differences by nation and sector are marginal: around one

[31] The share of establishments with bonus pay for trainees is 35 and 41 per cent for recognition and no recognition respectively; for skilled employees, the corresponding shares are 53 and 51 per cent.

half to two-thirds of employers in all six categories pay bonuses to trainees. The only attribute that potentially aligns with expectation is the greater ratio of individual to group schemes in Switzerland than in Germany.

6. Trainee Pay: Outcomes

Turning to pay patterns, trainee pay is defined in terms of base rates, i.e., excluding overtime, bonus, and thirteenth month payments, relative to the pay of skilled employees in the same occupation in the relevant country.[32]

Survey data (Table 6) show average pay of apprentices to be lowest in Switzerland, at 18 per cent of skilled pay; highest in England, at 45 per cent; and middling in Germany, at 27 per cent.[33] The inter-country differences are similar at sector level, for which the validity of the British data is greater.[34] In engineering, the pay of Swiss apprentices is only 14 per cent of that of skilled employees, i.e., well below that in Germany (29 per cent), which is in turn much less than that of Apprentices in Britain (41 per cent). In retailing, relative apprentice pay is generally higher than in metalworking, but the differences between countries are greater: 18 per cent in Switzerland, 34 per cent in Germany and fully 70 per cent in England.

The second source of information is the sample of establishments. Table 7 shows average trainee pay to be in all categories higher in the sample than in the survey data in Table 6. (The difference is not surprising, as the denominator in Table 6 is all skilled employees, and recently qualified ones in Table 7, which means higher relative pay on the sample definition.) The rankings of mean apprentice pay across countries in the sample are however the same as in the national surveys, with Britain and Switzerland occupying the opposite poles.

The sample shows the well-known difference between apprentice pay in Germany and Switzerland (Dionisius et al. 2008). Swiss apprentices receive only one-fifth (19.5 per cent) of the skilled rate in engineering, and not much more than one

[32] Earnings-based measures are available at national level only for Germany and Switzerland, for which they show a pattern by sector and country broadly similar to that in base rates (Ryan et al. 2010: 40-42).

[33] Definitions of base pay differ between the countries, but not greatly, and the same definition does at least apply to trainees and skilled workers in each country. The British survey lacks breakdowns of pay by stage of training. A subsequent survey (Fong and Phelps 2007) is informally described by official sources as erroneous.

[34] The mismatch between training and employment occupations is potentially greater in the British than the German and Swiss data as the pay data for the economy as a whole are not confined to skilled workers in the occupations that apprenticeship caters.

quarter (28.7 per cent) in retailing. Apprentice pay rates in Germany are 14 and 20 percentage points higher than in Switzerland in engineering and retailing respectively.

Table 6: Relative pay of apprentices and employees: national survey data

Mean base rates of pay of apprentices as percentage of those of skilled employees in the same occupations or sectors

		Year of training					Number of apprentices
		1	**2**	**3**	**4**	**All[e]**	
Whole economy	**GB[g]**	n.av.	n.av.	n.av.	n.av.	45.2	5500
	DE[f]	23.7	26.7	29.9	n.ap.	26.8	7502
	CH[f]	13.4	17.3	23.0	n.av.	17.9	2987
Engineering	**GB[a,g]**	n.av.	n.av.	n.av.	n.av.	40.9	500
	DE[b]	26.7	28.7	31.0	31.3	29.2	317
	CH[b]	9.0	11.8	15.6	19.8	14.1	391
Retailing	**GB[c,g]**	n.av.	n.av.	n.av.	n.av.	70.0	500
	DE[d]	29.5	33.8	39.1	n.ap.	34.2	178
	CH[d]	13.0	17.2	22.5	n.ap.	17.5	138

Sources. Unpublished data from 2007 BIBB survey and 2004 Berne survey of employers' training costs in Germany and Switzerland; Ullman and Deakin (2005), Figures 3.3, 4.2; *Annual Survey of Hours and Earnings*, 2005, Table 14.5.

Notes. n.av: not available; n.ap: not applicable.

Base rates in DE and CH are mean monthly pay, excluding social security contributions (both parties), additional month(s) pay, bonus and overtime pay; in Britain, mean net weekly pay, excluding bonus and overtime pay, and including any training allowance received, divided by mean weekly hours worked in the relevant framework (Apprentices) and the hourly earnings (excluding overtime pay) of full-time adult employees (all ages, both sexes) in 'skilled metal and electrical trades' (for engineering), 'sales assistants and retail cashiers' (for retailing) and 'skilled trades occupations' (for all sectors). Survey years: GB, 2005; DE, 2007; CH, 2004. Data for DE and CH are only for firms that train apprentices.

[a] Three year programmes only, for all apprenticeable occupations with such programmes.

[b] *Mechatroniker*, *Industriemechaniker*, *Elektroniker*, *Betriebstechnik* (DE); *Polymechaniker*, *Elektroniker* (CH).

[c] *Kaufmann/frau in Einzelhandel* (DE); *Detailhandelsassistent* (CH).

[d] Apprentices under Engineering Manufacturing Level 3 training frameworks.

[e] Apprentices under Retailing and Customer Care Level 3 training frameworks.

[f] Unweighted (DE, CH) or weighted (GB) mean of all training years (4 in engineering, 2 or 3 in retailing).

[g] Level 3 Apprentices. Apprentice pay refers to England and Wales, employee pay to Great Britain.

Two aspects of apprentice pay in Germany are of particular interest from an institutional standpoint. The first is whether employers that are not covered by collective bargaining (*ohne Tarifbindung*) pay their apprentices less than firms that are covered (*tarifgebunden*). Survey data show that relative pay (on an earnings basis) is indeed lower for apprentices in uncovered firms: by 3.1 percentage points in the economy as a whole, and 3.7 and 4.2 points in engineering and retailing, respectively. The second issue is the extent to which covered employers pay apprentices more than

the relevant *Tarif* rate. In the sample, most (11 out of 15) covered firms pay their apprentices more than *Tarif* rates. The premium averages around seven per cent in both sectors. In engineering that is only half the premium for skilled employees, but in retailing it is half as large again.[35] The two findings suggest that the decline of bargaining coverage in contemporary Germany is reducing the relative pay of apprentices, albeit only moderately.

Table 7: Relative pay of apprentices in sample establishments

Base rates of pay of apprentices as percentage of that of recently qualified skilled employees in the same occupation and establishment

		Year of training[a]					
		1	**2**	**3**	**4**	**All[b]**	**Number of cases**
Engineering	**GB**	48.5	58.5	68.3	78.5	63.5	8
	DE[c]	30.5	32.2	34.5	36.3	33.4	8
	CH	12.4	16.0	21.5	27.9	19.5	8
Retailing	**GB**	92.6[d]	n.a.	n.a.	n.a.	n.a	10
	DE[c]	42.3	48.7	54.4	n.a.	48.5	8
	CH	22.9	28.2	34.9	n.a.	28.7	9

Notes. n.a.: not applicable; n = 51
[a] Includes 13th month pay (*Weihnachtsgeld*) and holiday pay (*Urlaubsgeld*) where paid.
[b] Unweighted average for all years of training.
[c] Establishment (or company) level base rates, where different from *Tarif* rates.
[d] Pay of newly recruited inexperienced sales staff relative to unpromoted sales employees with one year's service.

Trainee pay is particularly high in Britain. In the engineering plants, Apprentices' base rates start at an average of 49 per cent of the skilled rate and average 64 per cent over the training period as a whole[36] – as compared to starting at

[35] Ryan, Wagner, Teuber and Backes-Gellner (2010), Tables 28-30.
[36] The starting rate for British engineering apprentices, at its historical peak in the July 1983 sector-wide ('national') collective agreement – which played at the time a role similar to that still played by *Tarif* agreements in Germany – was 47.5 per cent of the skilled rate. The lack of any substantial difference between that and the average in the current sample suggests that the erosion of collective bargaining, particularly for apprentices, has had little effect on apprentice relative pay, in these plants at least. Indeed, one pump producer still uses the apprentice age-stage scales that applied when sector-wide bargaining ended in 1989 (EEF 1993; Purcell 1993; Ryan 2010b). Moreover, a regional official of the largest union in the sector (Unite) recommends the adoption of the 1989 rates in new Apprenticeship programmes, and the employers' federation (EEF) did the same on its website until 2007. The managers of a pump producer attributed lack of union interest in apprentice pay to the company's need to continue paying such historically high rates.

12.4 per cent and averaging 19.5 per cent in Swiss engineering.[37] In retailing, the difference between Britain and the other two countries is even greater, because the training in the British cases concerns, not Apprenticeship, but in-house bespoke training for new employees. Three companies start their trainees at the rate for the job for experienced first-level sales employees. In the other companies, the training rate is close to the experienced rate. The average pay ratio for sales trainees is fully 92.6 per cent.

Table 8: Relative Apprentice pay in selected training occupations, England 2005.

Training occupation[a]	Apprentice pay		Employment occupation (code)
	Absolute (£/hour)	Relative (%)[b]	
Customer service	5.00	66.2	Customer service occupations (72)
Engineering	4.39	40.9	Skilled metal and electrical trades (52)
Retailing	4.32	70.0	Sales assistants, retail cashiers (711)
Construction	4.18	43.0	Skilled construction & building trades (53)
Early years care	3.31	46.3	Nursery nurses (6121)
Hairdressing	2.87	46.3	Hairdressers and barbers (6221)

Sources and definitions: Table 2
Notes. Level 3 Apprenticeships only.
[a] Grouped by Sector Skills Council.
[b] Percentage of mean earnings excluding overtime pay of employees in the employment occupation.

As engineering and retailing are located near the extremes in the distribution of training content in England's Apprenticeships programme, their representativeness is open to doubt. Is Apprentice relative pay high in other occupations as well? The subset of Level 3 Apprenticeship frameworks has a prospectively good match between statistics for training volume and employment, notably construction and hairdressing (Table 8). In Customer Service, as in Retailing, Apprentices receive more than two-thirds of mean occupational earnings. Apprentice relative pay in Construction is similar to that in engineering. In Hairdressing and Early Years Care, two female dominated categories, the pay of Apprentices is low in absolute terms (less than £3.50 an hour), but as these are low paid sectors, in relative terms it is 46 per cent of average employee earnings – which is high by German standards, let alone by Swiss ones. The conclusion is that in Britain Apprentice relative pay varies

[37] The dispersion of apprentice relative base rates across the engineering establishments is greater in Britain (coefficient of variation of 25.5 per cent) than in Germany or Switzerland (12.8 and 15.1 per cent respectively), which suggests a greater role for market forces and management discretion in Britain.

considerably across occupations but that the high relative pay seen in engineering and retailing is not exceptional. [38]

7. Trainee Pay: Determinants

What might cause these marked differences in trainee pay across countries and sectors? Six factors potentially contribute: training content, trainee age, bargaining coverage, contractual status, public subsidy; the supply of suitable young people; and monopsony power.

Training content

The first factor aligns with human capital theory: in competitive markets, the greater the amount and generality of the skill learned, the greater is the cost of training, the lower is the pay of trainees, and the higher is the pay of skilled workers. Put simply, more general training means higher skilled pay and lower trainee pay.

This factor is consistent with the great difference between trainee pay in British retailing and the other five country-sector categories. Initial training for sales staff in the British establishments is shorter, less formal, and undoubtedly less costly and more firm-specific than retailing apprenticeship in Germany and Switzerland. High trainee pay is therefore expected: young people will not accept low pay when there is little to learn.

The same cause may also contribute to the lower relative pay of apprentices in engineering than in retailing, in both Germany and Switzerland. Training costs are higher – for employers for sure, and for the economy in all probability – in metalworking crafts than for retail sales occupations. Skills may also be more firm-specific in retailing, where each company promotes its own approach to customer service.[39]

Differences in the level and generality of training cannot however be taken to contribute much, if anything, to an understanding of intra-sectoral differences in apprentice pay between the countries. Training standards are externally regulated in all cases, and appear to be similar across countries within each sector (apart from

[38] Table 8 may overstate Apprentice relative pay, in that only a minority of employees in the relevant occupations are expected to have Level 3 skills, and in some occupations, notably construction, craft training has been classified at Level 2. Using pay in Level 2 programmes instead, Apprentice relative pay is between 8 and 15 percentage points lower across the occupations in Table 8.
[39] Hasluck et al. (2008), Beicht et al. (2004), Muehlemann et al. (2007).

retailing in Britain).[40] In particular, Level 3 engineering Apprenticeships in England resemble their German and Swiss counterparts closely in terms of training methods (share of off-the-job learning, reliance on public colleges) and the predominance of employer sponsorship.[41]

At the same time, on-the-job learning may be less extensive, more firm-specific, and more uncertain *ex ante*, under Britain's National Vocational Qualifications, which have been developed under 'employer leadership' and which rely on internal assessment of Apprentices' skills, than under German and Swiss methods, in which training standards are determined by social partnership and assessment is external to the employer.[42] The British system makes it more difficult for the employer to commit to transparently high training standards, which in turn reduces the willingness of young people to accept low pay during training (Dustmann and Schönberg 2010). This consideration potentially applies with particular force to Apprenticeships in the service sector, notably Retailing and Customer Service, in which training standards have been developed by employers to serve their interests alone. Those standards are consequently lower, more firm-specific, and less assured *ex ante* than their continental counterparts. Higher Apprentice relative pay in the new service sector frameworks than in the traditional sectors (Table 8, above) is consistent with this line of explanation.[43] So too is the higher pay in retailing of sales trainees, for whom external training standards are non-existent, than of Apprentices, for whose training some external standards, however limited, are mandated.

The other side of the coin of training content is the pay of skilled workers. When qualified workers are highly paid, relative to less skilled adults, young people are incentivised to accept low pay during training in order to learn the relevant skill. Conversely, when skill adult differentials are low, as in British engineering during the 1970s, young people have less incentive to accept low pay during training (NEDO

[40] Detailed comparisons of skill standards across countries are difficult to perform and correspondingly scarce. A comparison of engineering apprenticeship in Britain and Germany in the 1990s concluded that skill standards had remained similar in the two countries despite the introduction of competence-based qualifications (NVQs) in Britain (Steedman 1998). The same view is also present in recent aggregate comparisons (Steedman, McIntosh and Green 2004).

[41] British employers have mostly retained the methods and standards formulated by the Engineering Industry Training Board in the 1960s (Senker 1991).

[42] Wolf (1995), Ryan (2010a), Wolter and Ryan (2010).

[43] A senior trade union official in retailing told us that her union would be willing to discuss a hypothetical proposal to trade lower Apprentice pay for more Apprenticeships, but that it would require the adoption of higher training standards and effective external assessment before agreeing any such package.

1977). Does such a situation accompany high apprentice pay in British engineering nowadays?

Table 9 shows that, although the pay differential between skilled and semi-skilled employees in engineering and retailing varies considerably across the three economies, the pattern is not consistent with the hypothesis. In engineering, the differential between the pay of skilled and semiskilled employees in Britain is similar to that in Switzerland, and considerably higher than that in Germany. Higher apprentice pay in Britain is therefore unlikely to reflect a lower prospective return to skill – or at least a lower immediate one.[44]

Higher pay for skilled workers may however be relevant to the difference between engineering in Germany and Switzerland: Swiss craft-workers are paid more than twice as large a premium over their semiskilled colleagues as are their German counterparts (35 and 14 per cent respectively), giving Swiss apprentices correspondingly greater incentive to accept low pay. The explanation does not however generalise: the reverse national ordering applies in retailing (8 and 16 per cent respectively), while the difference for the economy as a whole is modest (21 and 25 per cent).

Table 9: Pay differentials by skill in national statistics

Skilled earnings as percentage of less skilled (semi-skilled) earnings

		Engineering	Retailing	All sectors
GB	**2009**	131.9	106.9	114.1
DE[a]	**2008**	114.0	116.4	121.2
CH	**2004**	135.7	108.2	125.1

Sources. GB: *Annual Survey of Hours and Earnings 2009*, Table 14.5a (http://www.statistics.gov.uk/downloads/theme_labour/ASHE-2009/2009_occ4.pdf) DE: SB (2009), T4.1.1; CH: BFS (2006), T4, TA1

Notes. Pay. GB: Mean gross hourly earnings, all employees; DE: mean gross hourly earnings (*Bruttostundenverdienst*); CH. Mean gross monthly pay (*monatlicher Bruttolohn*).

Content of skilled and less skilled occupations: GB: Engineering: skilled metal and electrical trades, and assemblers and routine operatives. Retailing: sales assistants, and retail cashiers and checkout operators. All sectors: skilled trades, and process, plant and machine operatives. DE: Leistungsgruppen 3 (*Arbeitnehmer mit schwierigen Fachtätigkeiten, für deren Ausbildung eine abgeschlossene Berufsausbildung, zum Teil verbunden mit Berufserfahrung erforderlich ist*) and 4 (*Angelernte Arbeitnehmer mit einfachen, schematischen Tätigkeiten*) in C28 (*Maschinenbau*), 47 (*Einzelhandel ... ohne Kraftfahrzeug*) and B-S (*Produzierendes Gewerbe und Dienstleistungsbereich*). CH: Anforderungsniveaus 3 (*Berufs- und Fachkenntnisse vorausgesetzt*) and 4 (*Einfache und repetitive Tätigkeiten*) in SIC 30-32, 52, all sectors.

[a] Full-time employees only.

[44] Skill differentials do not capture all of the individual returns to training, and in particular its effects on the incidence of unemployment and on educational and occupational mobility.

Trainee age and education

The second actor is also consonant with human capital theory: the age and education of trainees. The older and more educated the trainee, the greater his or her prior skill, and therefore the greater his or her productivity and pay during training.

The average age of entry in Switzerland is nearly two years lower than in Britain and Germany (Table 10), a difference associated with a lower minimum school-leaving age (15 versus 16 years) and a higher incidence of direct moves from lower secondary schooling to apprenticeship. The difference is reflected in the sample: in all of the Swiss companies the principal age of entry is 15-17 years, whereas nearly one third of employers of British and German firms (11 out of 35) take primarily 18-20 year olds, many with upper-secondary school qualifications, nearly half (15 out of 35) take some adults, and all the British retailers hire mostly adults for sales training (Ryan et al. 2010: Table 12). The high relative pay of trainee sales staff in Britain is consistent with a preponderance of adults among trainees, by contrast to that of teenagers in the apprenticeship systems in the other five country-sector categories.

Table 10: Age of entry to apprenticeship by country, national statistics

	Year	Age of entry	
		Median	Mean[a]
Britain	2005-6	n.a.	19.3[b]
Germany	2007	19	19.4
Switzerland	2008	n.a.	17.6

Sources. CH: www.bfs.admin.ch/bfs/portal/de/index/themen/15/04/ind4.indicator.40703.407.html;
DE: http://datenreport.bibb.de/media2009/uebers_a5_7-1.pdf;
GB: http://www.thedataservice.org.uk/NR/rdonlyres/9E52C066-6BCE-4B13-B3FD-DA002A6A8C13/0/Post_16_Education_March_2010.pdf
Notes.
[a] Estimated for Britain from a coarser age breakdown than for the other countries.
[b] Level 3 programmes (Level 2: 18.5).

The lower experience and fewer years of education of Swiss apprentices are therefore potentially important for an understanding of their low pay. But it provides only a partial explanation, particularly for base pay rates. The pay scales applicable to the many German and British youth who start apprenticeships at age 16-17 are so high relative to those of their Swiss counterparts that the difference cannot plausibly be explained in terms of the one year difference in age and schooling between direct entrants in Switzerland and the other two countries. Moreover, when differences in

educational attainment are measured in terms of the amount learned rather than time spent in school, the prior skills of the Swiss 15 year old apprentice compare favourably to those of his or her 16 year old British counterpart (Bierhof and Prais 1997; OECD 2001).

The first three factors therefore align empirically with some but not all of the main differences in trainee pay across the six country-sector categories. The differences that they cannot explain point to more institutional factors.

Collective bargaining

The foremost one is collective bargaining. Higher apprentice pay in Germany than in Switzerland has been attributed to higher collective bargaining coverage (Dionisius et al. 2008). The implicit assumption is that trade unions not only seek to raise pay, but want and manage to do so more strongly for trainees than for skilled employees.

In Germany, most firms, in both national data and the sample, are covered by a *Tarif* agreement. Those agreements specify pay for apprentices as well as employees. Some German union officials would like to raise apprentice pay further. A senior negotiating official of IG Metall, the large metalworking union, explained that his union would like apprentices to receive 35 to 40 per cent of the craft (*Facharbeiter*) rate. Such a policy is consistent with the union's manifest concern for the recruitment and integration of young members (IGM 2010).

Here Switzerland differs considerably from Germany. In the previous section it was shown that the difference in national bargaining coverage is – in the sample at least – even greater for apprentices than for employees. Most of the Swiss employers set apprentice pay themselves and some increase it only sporadically. The trade union Unia estimates that one-third of Swiss apprentices are not given a 13^{th} month's pay every year, a benefit that the great majority of their German counterparts can take for granted (Lehrlingslohn 2008). The German-Swiss evidence is therefore consistent with an important role for collective bargaining as a source of differences in relative pay. But limits to the explanation are suggested by two factors.

The first qualification emerges when Britain is considered – which limits the discussion to engineering. As in Switzerland, bargaining coverage is low in Britain. Moreover, although six of the eight British engineering establishments have collective bargaining, in only one does apprentice pay feature on the bargaining agenda. Yet apprentice relative pay is high, both in national statistics and in the sample.

Differences in unionisation and collective bargaining cannot explain this aspect of the cross-country pattern in apprentice pay.

The second consideration comes from the IG Metall official mentioned above. The pay increase that his union would like is not negligible, amounting to five to ten percentage points more than at present (Table 6). But it is not a high bargaining priority. Moreover, it would leave apprentice relative pay well below the levels prevailing in British engineering. The union's policy remains consistent with interpretations that see German unions, particularly IG Metall, as not having used to the full their power to increase apprentice pay, in order to help sustain a large, high quality training system (Marsden and Ryan 1991b; Thelen 1991).[45]

Collective bargaining may however cause a secondary difference between apprentice pay in Germany and Switzerland: how strongly pay rises during the training period as a whole. The difference between the scale rates of last year and first year apprentices is 5.8 percentage points in engineering in Germany, and 15.5 points in Switzerland (Table 6, above). The difference may reflect the greater power of metalworking trade unions in Germany, along with a preference for less inequality among apprentices. In retailing, pay growth during training is no less in Germany than in Switzerland – but the cross-national difference in trade union strength is also lower.

Trainees' contractual status

The contractual status of trainees potentially affects differences in trainee pay between the two sectors in Britain and between engineering apprentices across the three countries. Institutionalists argue that apprentice status legitimates, in the eyes of employees and trade unionists in particular, payment systems based on stage of training rather than job status. This is because the associated regulation of training content neuters the threat of cheap trainee labour to their job security and bargaining power (Marsden and Ryan 1991a). That in turn makes institutionally feasible low trainee pay and low training costs for employers. The point is potentially relevant to the inter-sector difference in trainee pay in Britain. The higher relative pay of sales trainees than of Apprentices in retailing (Tables 6, 7) is consistent with the difference

[45] Attempts to formalise the implicit contract by trading lower apprentice pay for more training places, as promoted by the various *Bündnis für Ausbilding* initiatives of the past decade, have indeed come to little (VBM 2007), but the failures can be attributed more to the reluctance of employer representatives to commit to a pre-specified increase in training places than to any refusal by unions to make such an agreement – as the union interviewees in both sectors suggested their organisations would consider doing.

in status, between the former as mainstream employees and the latter as Apprentices, notwithstanding the limitations of training standards in retailing Apprenticeship.

The second dimension to which contractual status is relevant is the difference between the pay of engineering Apprentices in Britain and their counterparts in Germany and Switzerland. More than 90 per cent of British Apprentices (and all those in our sample) are said to hold an employment contract, not just a training contract (LPC 2009: 157).[46] Employee status need not mean high pay. British Apprentices are not covered by the National Minimum Wage if they are less than 19 years old or in their first year of training. Employee status does however entitle Apprentices to a minimum income of £80 per week[47], in contrast to the Minimum Training Allowance of £40 per week that constitutes the floor for Apprentices who have trainee status alone (LPC 2009: 156, 157; TUC 2008).[48]

By contrast, German and Swiss apprentices hold only a training contract. In both countries apprentice status and employee status are clearly separated, not least by the difference between the allowances paid to apprentices (*Lehrlingslohn* and *Vergütung*, respectively) and wages and salaries paid to employees (*Lohn*, *Gehalt*). 'Waged' or employee status does not *per se* alter the fixed-term nature of the Apprenticeship contract in Britain, much as in the other two countries.[49] But it does arguably make possible in Germany and Switzerland lower pay for apprentices than would be institutionally possible were apprentices to hold an employment contract as well.[50]

In Britain, the option of reviving the common law apprenticeship contract has not been taken up. The primary concern when (Modern) Apprenticeship was

[46] Data on the share of Apprentices with employee status are scarce. The 'over 90 per cent' estimate was provided by government officials in oral evidence to the Low Pay Commission (loc. cit.). An official review has however suggested that employee status either already is, or at least will become, necessary to be counted as an Apprentice (DUIS 2008: 6, 22).

[47] Since raised to £95 per week.

[48] Non-employed Apprentices who do not have have a work placement (in 'programme-led Apprenticeships') are entitled only to the Education Maintenance Allowance of £30 per week.

[49] In all three countries, apprentices hold a fixed term contract, which in principle excludes any right for the apprentice to continue with the employer after training. The promotion of employee status in Britain has however had effects here too. Although the employment contracts held by Apprentices are formally fixed-term, employers are free to offer them permanent contracts, and one large engineering company in the sample does just that, rendering it liable to make a redundancy payment if it fires an Apprentice after training. The share of Apprentices who hold a permanent contract of employment is not known but, given that nearly half were employed by the training firm before joining the programme (Ullman and Deakin, 2005: 11), it may well be considerable.

[50] Indirect evidence consistent with the proposition is the higher level of relative apprentice pay in countries in which apprentices hold an employment contract (Austria and Ireland) than in those in which apprentices have trainee status only (Germany, Switzerland and Denmark; Ryan 2000: Table 4).

introduced in 1994 was to improve the programme's status relative to its immediate predecessor, Youth Training, in which widespread trainee status was associated with a low training allowance and limited training content (Lee et al. 1990; Ryan and Unwin 2001). Encouraging employee status was a way of doing that. Moreover, recent legislation locates Apprenticeship agreements nearer to the regular contract of employment ('service') than to the common law contract of apprenticeship (Parliament 2009: 15-16).

Differences in contractual status therefore contribute to the difference between Apprentice pay in Britain and apprentice pay in the other two countries. However, contractual status may itself be endogenous. The British government's promotion of employee status in order to increase the status of the Apprenticeship programme parallels the benefit to employers of offering employee status to encourage applications for Apprenticeship places. If so, contractual status interacts with youth supply conditions in influencing trainee pay.[51]

The supply of young people to apprenticeship

A further potential cause of high trainee pay in Britain and low apprentice pay in Switzerland is differences in the supply of suitably qualified young people. At one level a supply problem appears unlikely: in all three countries, all of the companies report more acceptable applications than vacancies in their apprenticeship programmes. However, British engineering firms have lower ratios of acceptable applications to vacancies than do their German and Swiss counterparts (Table 11), despite much higher trainee pay scales. Three of them express particular concern about the number and quality of young applicants. They attribute the shortfall to the low status in the eyes of parents and teachers of apprenticeship, associated with the low status of manual skill, the industry's history of shrinking employment and redundancy, and lack of information about subsequent opportunities for occupational mobility. They report a widespread preference for full-time education among moderately qualified 16-18 year olds, consistent with the rapid expansion of publicly funded full-time tertiary education.[52] One employer did see high Apprentice pay as

[51] A different status issue has led one engineering firm voluntarily to increase its already high scale rates for Apprentices: in order to counteract the traditionally low status of apprentices, relative to graduates from full-time vocational programmes who do the same (technician-level) work.

[52] Some interviewees attribute widespread youth preference for full-time education to the weaknesses of careers advice in secondary schools, associated with lack of knowledge or respect for career

generating more applications, but even then for potentially suspect reasons ('they're only in it for the pay').

Not all British firms suffer from supply constraints. Two establishments owned by large engineering multinationals with strong reputations – an aero engine and a turbine manufacturer – both attract a large excess of acceptable applications, despite accounting for large shares of engineering employment in their districts. Also, a pump company that had found it hard to fill its training places reports a recent easing in the problem, which it attributes to higher achievements in compulsory schooling, the introduction of a GCSE in engineering, and increased recruitment effort. But it still pays its apprentices the old national scale rates, partly to increase their loyalty to the firm.[53]

Table 11: Applications and vacancies in apprenticeship programmes, sampled establishments

		Ratio of applications to vacancies		
		All applications	**Acceptable applications[a]**	**Number of companies[b]**
Engineering	**GB**	7.8	3.2	6
	Germany	21.4	11.6	5
	Switzerland	17.4	7.2	7
Retailing	**GB**	n.a.	n.a.	-
	Germany	34.5	5.5	7
	Switzerland	39.3	13.6	10

Notes
[a] In some cases, only applicants who were actually called to interview could be counted.
[b] Excluding companies that either use a third party to screen applications or provided no data.

Nor are all German firms free from supply constraints. An official of the engineering employers' association (Gesamtmetall) states that recent *Bündnis*-type proposals to reduce apprentice pay in order to fund more training places were opposed by many members because of a scarcity of talented applicants. That difficulty even led a large turbine manufacturer located in a major city to leave its apprentice vacancies unfilled in a recent year. Less surprisingly, a large retailing group that contains small grocery stores, many of whom pay less than *Tarif* rates, finds it hard to

opportunities in engineering, and the financial incentive to schools to induce 16-year-old pupils to continue in full-time schooling.
[53] A further possible source of increased youth supply – increased tuition fees for full-time tertiary education – was not mentioned by any employer.

attract youth to its centralised apprenticeship programme despite extensive youth joblessness in its region.[54]

By contrast, the supply of young people to apprenticeship is bolstered in Switzerland, not just by the high national status of technical skill and apprenticeship training, but also by two attributes of the national education and training system. The first is some rationing of access to general upper-secondary education. Only 20 per cent of the youth population attends a general upper-secondary school (*Gymnasium*).[55] The rate varies greatly from canton to canton, for reasons that are not fully understood.[56] Nevertheless, in some cantons pupils who leave lower secondary education with middling grades appear in effect to be steered into apprenticeship by the difficulty of obtaining a *Gymnasium* place.[57]

The second Swiss attribute is well developed ladders of vocational qualification, which facilitate movement from apprenticeship to tertiary education. Apprentices can study part-time for the vocational equivalent (*Berufsmaturität*) of the general upper secondary qualification (*Maturität*) that gives access to university. Those who qualify are entitled to apply for a vocational programme at a non-university tertiary institution. Around 12 per cent of apprentices study for the *Berufsmaturität*, whether during or after their apprenticeship (BBT 2010). The option value of this alternative increases the appeal of apprenticeship to many young people, particularly the more energetic and able ones. This aspect of the Swiss system is distinctive in comparison to both Germany and Britain. In both countries the desirability of establishing ladders from apprenticeship to tertiary education is widely recognised, and some apprentices in the engineering and retailing companies make the transition. But neither country has as yet developed a formalised, well-known, and respected equivalent of this Swiss attribute.

[54] More generally, the post-unification boom of the early 1990s created excess demand for apprentices and consequent increases in scale rates (Wagner 1999).
[55] In addition, approximately 12 per cent of the youth cohort attend other full-time school-based options, whether general or vocational in content (SKBE.CSRE 2010: Fig 71).
[56] In six (out of 26) cantons the share of *Gymnasium* graduates in the 19 year old population was 15 per cent or less in 2008, as compared to a national average of almost 20 per cent (SKBF/CSRE 2010: 123).
[57] The presence of canton-level rationing in entry to *Gymnasia* (and their vocational equivalents) at upper-secondary level is suggested by the maximum entry shares imposed by some cantons, though a recent official report reached no firm conclusions on the issue (loc. cit). Any rationing appears to be less than absolute, as, when the size of the youth population cohort rises, so does the number of *Gymnasium* entrants. However, as the marginal rate of youth entry is only one quarter the size of the average rate, some intensification of rationing seems to occur in demographic upswings (Muehlemann, Wolter and Wüest 2009).

Differences in the appeal of apprenticeship to young people and the availability of alternatives to apprenticeship potentially contribute therefore to an explanation of the difference between apprentice pay in Britain and Switzerland.

Public subsidy

Public training subsides may also influence apprentice pay. Britain differs radically in terms of the level and manner of public funding. In Germany and Switzerland, public subsidies are confined largely to covering the direct costs of part-time education in public colleges, for which no fees are charged. The costs of training at the workplace fall to the employer and the apprentice. In Britain, by contrast, most Apprentices receive no part-time education, and, of those who do receive off-the-job instruction, many are taught by specialist training companies rather than public colleges. Public subsidy goes, not directly to public colleges for vocational education only, but rather to the principal contractor for an entire Apprenticeship programme. In practice, much of the public subsidy is absorbed by the prime contractor, and used to cover the high cost of the competence-based assessments and compliance-related paperwork involved in the Apprenticeships programme.

The subsidies can be substantial. The British government paid in 2004 nearly £15,000 to an employer who took on a 16-18 year old for a Level 3 Apprenticeship in engineering, and £6,500 for one in retailing (Ryan, Gospel and Lewis 2007). Public funds also cover tuition fees for any part-time vocational education received by Apprentices aged less than 19, which, again exceptionally, remains widespread in engineering.

The public purse therefore provides direct subsidies to British employers who provide Apprenticeships, unlike their counterparts in the other two countries.[58] The subsidies cover only a minority share of the employer's cost for Apprenticeship in engineering, but most or all of it in retailing (Hasluck et al. 2008). Either way, these grants may lead employers to pay their Apprentices more than would be the case in their absence. If so, they contribute to higher trainee pay in Britain than in the other two countries. The comparative shortage of attractive applicants in British engineering

[58] Collective funding of apprentice training (*Berufsbildungsfonds*), with compulsory contributions by employers who do not provide training, has been introduced (selectively by occupation and canton) in Switzerland in recent years, but the rate of subsidy appears to be low by British standards (SKBF/CSRE 2010: 149).

encourages employers to use the subsidies to raise Apprentice pay. No comparable effects are expected under the German and Swiss funding regimes.

Monopsony power

Buyer power in the labour market is potentially relevant to the difference between apprentice pay in Germany and the other two countries, particularly in engineering. The Swiss comparison is taken first.

Section 2 noted that economic models of training mostly assume that the market for training places is either perfectly competitive or subject to a wage floor. The assumption of competition appears more appropriate for Switzerland than for Germany, given the difference in bargaining coverage for apprentices in the two countries. But the absence of collective bargaining is not synonymous with perfect competition. The low pay of Swiss apprentices may reflect greater monopsony power for Swiss than for German employers.

Some of the factors that create monopsony power are potentially more marked for Swiss apprentices than for their counterparts in other countries. The fact that apprentices are younger at entry should mean greater dependence on the parental household, and therefore fewer mobility-based alternatives to a particular employer's apprenticeship programme, even within a given local labour market. The effect is potentially intensified by the smaller size of Swiss towns and cities.

There is also the content of the Swiss institutions that affect apprentice pay-setting. Formally, employers remain free to compete for apprentices and to set apprentice pay accordingly. Section 5 noted that Swiss employers appear mostly to adhere to the pay recommendations of occupational associations (BVs). However, while those recommendations may influence the individual employer's decision, and constrain its exploitation of monopsony power, their generally low level may result from the scope Swiss employers have to reduce pay-based competition through BV-based coordination. This is particularly likely when the BV is an employers' association, with its decisions not directly influenced by trade unions or public authorities.[59] Two interviewees state that employers prefer to limit the availability of their associations' information on apprentice pay, a topic on which no official statistics are published.

[59] The three BVs responsible for training in two large occupations covered here (Swissmechanic and Swissmem for *Polymechaniker*, Bildung Detailhandel Schweiz for *Detailhandelsfachmann/frau*) are all employers' associations.

Further evidence suggestive of monopsony power in apprentice pay setting comes from studies of employers' training costs. A majority of the Swiss employers who offer apprenticeships incur *negative* net costs, whereas that applies to only a small minority in Germany (Dionisius et al 2008).[60] This attribute of the Swiss distribution would not be expected to endure were the market for apprentices highly competitive: the incentive to employers to use more apprentices in production would drive up apprentice pay. No substantial change in it is however visible between recent surveys of training costs (Schweri et al. 2003; Mühlemann et al, 2007). The implicit weakness of competition for apprentices suggests a role for monopsony power in Swiss training markets as a whole.[61]

Such considerations do not *per se* establish a role for monopsony power, which is in any case notoriously difficult to measure. Indeed, in Swiss retailing, competition for apprentices appears to be increasing, and with it apprentice pay.[62] In the absence of direct evidence on monopsony effects on apprentice pay, it is argued only that it may contribute to lower pay for apprentices in Switzerland than in Germany.

Monopsony power is not however likely to be a major influence on the pay of engineering Apprentices in Britain. Despite low bargaining coverage and the locational isolation of many plants, as in Switzerland, apprentice pay is much higher than in Switzerland. Supply constraints in the training market arguably reduce apprentice dependence on employers.

Finally there is a broader potential explanation of the low pay of Swiss apprentices: the existence of an implicit understanding among the interested parties (government, trade unions and employers) to hold down apprentice pay. (Monopsony power would be necessary for any such understanding to hold.) The potential public benefit is, apart from a larger apprenticeship system, more gradual youth transitions, from school to employment and from dependence on parents to financial independence. Apprentices might be deemed to require or deserve only a low income, and as having no claim to luxuries until they qualify.

[60] Other evidence supports the finding that even in Germany a significant minority of employers earn a surplus during the training period (Mohrenweiser and Zwick 2009; Backes-Gellner and Mohrenweiser 2010).

[61] A further factor that may restrict competitive pressure on the pay of Swiss engineering apprentices is group training bodies, who train the apprentices of three out of nine companies in the sample, employing them during at least the first two years of training, and paying them at a standard rate.

[62] A striking example is the advertising of high apprentice pay by the discount food retailer Aldi as part of its current expansion in Switzerland.

Three considerations align with this interpretation. First, there is the country's discursive and consensual approach to socioeconomic policy-making.[63] Second, Swiss trade union officials claim to seek, not higher pay for apprentices in general, but rather curbs on very low pay, through the general adoption of both 13th month payments and BV-recommended pay rates.[64] Finally, as living standards are higher in Switzerland, lower relative pay need not mean a lower absolute standard of living than that of their British or German counterparts. The difference in absolute apprentice income between the countries is indeed less than that in relative pay – though it remains considerable in engineering when the high price level in Switzerland is taken into account, using PPP exchange rates (Table 12).

Table 12: Average monthly pay of third year apprentices in sample establishments in national currency, converted to a common currency

		National currency	Common currency: actual rates	Common currency: PPP rates	No. of cases
Engineering	**GB**	£ 1120	$ 2058	$ 1692	8
	DE	€ 801	$ 1172	$ 933	8
	CH	SFr 998	$ 922	$ 608	8
Retailing	**DE**	€ 764	$ 1119	$ 891	10
	CH	SFr 1320	$ 1219	$ 804	10

Notes. Unweighted means, in dollars at actual and purchasing power parity (PPP) exchange rates for 2008.
Sources. Exchange rates: http://stats.oecd.org/Index.aspx?datasetcode=SNA_TABLE4

8. Conclusions

Trainee pay plays a central role in the economics of training, mediating the division of training costs between the employer and the trainee. Economic models of training mostly assume that it is set competitively, i.e., by clearing in the market for trainee places, even when imperfect competition is assumed for skilled labour. Some models specify instead an exogenous wage floor for trainee pay. The range of pay setting methods and pay outcomes is however much broader in practice. Their potential determinants include both competitive and institutional factors. Moreover, alternative ways of setting trainee pay may have different implications for training outcomes – in

[63] It may be no coincidence that Aldi, the discount retailer whose competition for young talent is pushing up apprentice pay in retailing, is an outsider, as a German newcomer with an innovative product market strategy and an incentive to act outside established Swiss practices.
[64] However, the broad acceptance by Swiss unions of the broad level of apprentice pay may reflect their limited power to do anything about it.

particular, where monopsony power leads to low pay for trainees, it may induce employers to offer more training, not so much to ensure their future skill supplies as to reduce their immediate operating costs.

Trainee pay has been analysed for two sectors (engineering and retailing) in three countries (Britain, Germany and Switzerland), using evidence taken from both national sources and in-person interviews with employers, unions, public officials and interested parties.

In terms of how trainee pay is set, the role of collective bargaining varies greatly. Collective bargaining for employees remains widespread in Germany, where it covers apprentices as well as employees. German unions express interest in raising apprentice pay, but they do not rule out trading lower pay for more training places. In Britain and Switzerland collective bargaining is less widespread, and it rarely applies to apprentices even when it does to employees.

The coverage of trainees by performance-related pay is moderately high, and some employers not only include trainees in group bonus schemes but also offer individual bonuses to apprentices for performance in part-time vocational education. However no substantial association is found between the use of bonus pay and union presence, nor are there marked differences in incidence by sector or country.

The evidence on pay outcomes suggests important roles for both competitive and institutional factors. The lower pay of Swiss than of German apprentices aligns with both their lower age, lower coverage by collective bargaining, and favourable options for continuing education. It also reflects restrictions on the access of Swiss youth to full-time upper-secondary education, and possibly also monopsony power, which, in the absence of collective bargaining, may apply more strongly to apprentices than to skilled workers.

The higher pay of British than of German (engineering) apprentices cannot by contrast be explained in terms of bargaining coverage, which is particularly low for apprentices in Britain. It is associated instead with widespread employee status among Apprentices and larger public subsidies, and more fundamentally with a lower supply of qualified young people to apprenticeship. It may result also from weaker and less assured training standards, given the weakness of external quality control in the Apprenticeships programme. That factor is however likely to play a smaller part in engineering, with its Training Board heritage, than in retailing, where training standards are recently developed and pitched at a low level. In retailing it may also

contribute to the higher trainee pay in bespoke in-house programmes than in Apprenticeship.

It cannot be claimed, given the limits of the evidence, that the role of these determinants of trainee pay has been clearly established. Nevertheless, it is hoped that this paper has suggested new lines of interpretation and promising directions for further research.

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Appendix: research methods and establishment attributes

Our engineering cases are chosen from national listings of British and Swiss establishments by four-digit Standard Industrial Classification (SIC) code, as compiled by Dun and Bradstreet. That source shows for pumps, turbines and compressors significant numbers of medium-sized establishments (broadly speaking, between 100 and 700 employees) in both countries. We identified comparable German producers from various German sources, including the directory *Wer Liefert Was?*, concentrating the German search on four regions: Berlin, the Ruhr, Baden-Württemberg, and Hamburg. Although we did not seek specifically to include establishments located in the former DDR, two of the Berlin-based retailing establishments are located there. The inclusion of additional subsectors in both engineering and retailing resulted from the need to include German companies that are not covered by collective bargaining (*ohne Tarifbindung*), none of which could be located in the core subsectors. Although we did not specifically seek only establishments that provide apprenticeship training, our sample comprises almost entirely those that do – with the important exception of British retailing, in which none of the stores or divisions in our sample operates an Apprenticeship programme.

Table A1 shows the distribution of interviewed establishments across subsectors. These sectors account for around 0.5 per cent (engineering) and between 2.8 and 5.4 per cent (retailing, in Switzerland and Britain respectively) of total employment in the three countries. The data refer in engineering mostly to middle sized establishments owned by large companies, and in retailing mostly to groups of small to medium sized stores, most of them part of large national retail chains (Table A2).

Companies that declined to participate were replaced by comparable ones until a full set of interviews had been obtained. The participation rate among companies approached was 79 per cent in Switzerland, 60 per cent in Germany, and 43 per cent in England. It is likely that our sample is implicitly selected towards (i) larger parent companies and (ii) bigger and better apprentice training programmes. Selection bias is least troubling for Swiss engineering, in which the response rate is high and sample size is close to population size.

Table A1: Number of participating establishments by sector

Sector	Subsector	SIC 1987	GB	DE	CH	All
Engineering	**Pumps and pumping equipment**	3561	4	4	4	12
	Turbines and turbine generator sets	3511	1	2	2	5
	Air and gas compressors	3563	0	0	1	1
	Aircraft engines and parts	3724	1	0	0	1
	Electronic components, n.e.c.	3679	3	2	2	7
	All engineering subsectors		9	8	9	26
Retailing	**Department stores**	5311	4	2	3	9
	Grocery stores[a]	5411	3	3	2	8
	Shoe stores[a]	5661	1	2	2	5
	Furniture stores[a]	5712	1	1	1	3
	Radio, TV and electronics stores[a]	5731	1	2	2	5
	All retailing subsectors		10	10	10	30
All			19	18	19	56

Note: a. Groups of stores, typically at regional (division) or national (company) level

Table A2: Employment and training in participating establishments

		Engineering			Retailing		
		GB	**DE**	**CH**	**GB**	**DE**	**CH**
Employment	**Median**	377	500	308	1334	3348	333
	Mean	1739	2959	288	37650	12957	2406
	Share (%)[a]	4.2	10.5	11.2	45.7	42.4	42.8
Apprentices	**Mean**	27	68	39	0[b]	598	155

Note: participating establishments comprise single ones in engineering and, in retailing, both single establishments (department stores) and groups of establishments (divisions, regions and companies).
[a] Share of total employment in parent company or group.
[b] Sales trainees only (no Apprentices).
Eighteen of the establishments are the subsidiary of a parent company shared with one or more establishments in the other countries. Most are simple pairs, whether German/British or German/Swiss; one group involves four establishments in a single large company, spread across the three countries. Most of the paired establishments are in engineering (Table A3).

Table A3. Establishments with the same multi-national parent company

	GB/DE	DE/CH	GB/DE/CH	All
Engineering	2	3	1	6
Retailing	1	1	0	2
Number of establishments	6	8	4	18

Most interviews were conducted by two or three members of the research team; a handful, by one or by all four. A team member based in the establishment's own country was present in all cases. The interviews, which lasted around 1.5 hours on average, were conducted around a detailed questionnaire, the content of whose English and German language versions was close. Some interviews in Germany and Switzerland were conducted in English. A short (two page) statistically-oriented excerpt was sent to interviewees to complete in advance. In a few cases some key data could not be obtained.