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Apprenticeship in Europe: 'Fading' or Flourishing?

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Abstract
This paper sets out the extent and defining characteristics of apprenticeship in Europe. Apprenticeship is then situated within the wider context of European provision for education and training of 16-19 year olds and a simple typology is proposed and explained. The German-speaking dual system countries are characterised as high employer commitment countries with minimal integration of apprenticeship into full-time 16-19 provision and weak links with tertiary education. The UK, the Netherlands and France are characterised as having relatively low levels of employer commitment but greater integration of apprenticeship into full-time provision and stronger links between apprenticeship and tertiary level provision. Recent evidence on the extent to which both apprenticeship models improve employment probabilities is reviewed and pressures on the two apprenticeship models resulting from increasingly competitive global markets and consequent changing skill needs are examined. A final section discusses whether apprenticeship in Europe can adapt to and survive these pressures.

Keywords: apprenticeship; dual system; school to work transition
JEL Classifications: I 21; J24
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Introduction

This paper aims to review (for a non-European audience) the common characteristics of apprenticeship in Europe and to situate the institution of apprenticeship within the wider context of education and training provision for young people as they prepare to enter the labor market. The paper argues that, despite common characteristics, two models of apprenticeship can be identified in Europe having different sources of strength and weakness. These differing patterns of strength and weakness are analyzed as they affect supply-side and demand-side trends in apprenticeship provision. This review and analysis forms the basis for a considered response to the question of the future of apprenticeship in Europe - 'fading or flourishing' - as a significant source of skills and of education and training for young people.

Apprenticeship plays a significant role in skill development and youth education and training in Europe; most important are the German-speaking 'dual system' countries, Austria, Germany and Switzerland.[1] In addition, France, Denmark, the Netherlands and the UK all have significant numbers in apprenticeship and are also included in this study.[2] The combined population of these countries, some 240 million is not too different from that of the US (290 million). Finance, employer involvement and youth participation vary from country to country in Europe. However, a core framework (variously regulated) which reflects the principles of apprenticeship, can be identified in all seven countries referred to above.

By apprenticeship, we understand a model of learning - mainly for young people and based primarily in the workplace - in which the apprentice acquires the skills and knowledge required of the skilled worker, technician or professional practitioner. Successful completion leads to recognition of skills acquired by means of nationally-agreed certification processes. Good apprenticeship has the capacity to meet the aspirations of many young people for relevant and flexible education and training and to develop potential and aspirations that are often neglected in school-based education provision (Steedman, Gospel and Ryan 1998).

[1] 'Dual system' refers to the fact that apprentices in Austria, Germany and Switzerland are trained and educated in two places concurrently, namely the employer's premises and while on day or block release at the vocational school.

[2] Other European countries, e.g. Ireland, Italy, Portugal, also make an apprenticeship offer to young people. However, proportions enrolled are relatively small at present. The seven countries selected here have been chosen because of substantial numbers enrolled or, in the case of France, because of significant recent reform and growth.

This paper briefly sets out the extent and defining characteristics of apprenticeship in Europe (Section 1). In Section 2 apprenticeship is situated within the wider context of European provision for education and training of 16-19 year olds and a simple typology is proposed and explained. Section 3 examines evidence on transition from apprenticeship to work. Section 4 examines some of the current pressures on apprenticeship and their effect on demand and supply. A final section discusses whether apprenticeship in Europe can adapt and survive.

Section 1 Apprenticeship in Europe: what it is and how it works[3]

The German-speaking dual-system countries (Austria, Germany, Switzerland) have a strong apprenticeship tradition. In Germany and Switzerland some two thirds of all young people embark on apprenticeship training, in Austria around 40 per cent do so. In Germany and Switzerland occupations prepared for by apprenticeship cover all economic sectors i.e. in craft, industry and trade, liberal professions, and services. In Austria, apprenticeship prepares predominantly for artisan-type occupations and full-time higher level vocational colleges prepare for associate professional and technical occupations. Apprenticeship in the German-speaking dual-system countries is structured by the concept of *Beruf* and apprenticeship training can only be provided in a recognized occupation. The *Beruf* or professional occupation is defined by a coherent set of skills that combine together to form both an occupational and a social identity. The concept of *Beruf* has been identified both as an instrument of social integration of new generations and as an organising principle for economic activity in German companies (Bertelsmann Stiftung/Hans-Böckler Stiftung, 1998). Recent research indicates that the focus on *Beruf* is not as restrictive as it might at first appear to a non-European audience since much dual system training appears (from analysis of subsequent earnings data) to be transferable to a wide range of occupations outside the occupation originally learnt in apprenticeship (Clark and Fahr 2002).

Like the German-speaking dual system countries, Denmark also has a long tradition of apprenticeship. A rolling program of change and reform has been in place for the past twenty years and the proportion of young people entering apprenticeship has remained roughly constant. Young people in Denmark frequently experience difficulty in finding an employer to offer an apprenticeship place and vocational colleges support those searching for a place and take responsibility for those who cannot obtain an offer. Currently around a third of all young people in Denmark gain a vocational qualification through apprenticeship.

The Netherlands has completely restructured vocational education following new legislation in 1996. Apprenticeship numbers, which had been declining in the 1980s, reversed that decline in the 1990s and are continuing to increase. As in Denmark, currently around one third of young people in the Netherlands enter an apprenticeship program.

[3] Steedman (2001a) available at http://cep.lse.ac.uk . This paper provides references to all sources of information used in this section. A shorter version appeared as Steedman (2001b).

Around 220,000 were in apprenticeship programs in England in 2002 - this represented 17 per cent of a young age cohort (National Statistics 2004). Since 1994 government has provided renewed support - both political and financial - for apprenticeship; training programs and requirements have been reformed and numbers entering have increased. Employer placements are found through 'gatekeepers' generically termed 'training providers' who also take responsibility for providing skills training. Unlike all other apprenticeship programs in Europe, apprenticeship in the UK is not governed by a statutory framework. This means that, while employers must ensure that apprentices receive training, this can be provided on employers' premises and employers are under no obligation to release students for off-the-job training or to adhere to a specified duration for apprenticeship. Apprentices in the UK are required to work towards a recognized national skill qualification (National Vocational Qualification (NVQ) Level 2 or 3).[4] A recent survey shows that two-thirds of apprentices receive their training for NVQ 2 or NVQ 3 level qualifications off-the-job and one third receives training on employers' premises. The amount of off-the-job training received varies from one hour a week in for apprentices in the retail sector to ten hours per week in the Engineering sector. In addition to off-the-job training, 87 per cent of apprentices reported receiving on-the-job training on a regular basis (Ullman and Deakin 2005).

France has a similar model of apprentice training with employer organizations acting as brokers between apprentices and employers. Apprenticeship Centers run by employer organizations and co-financed by employers and the state try to ensure a supply of apprenticeship places. Until 1987 apprentices were only allowed to gain the lowest level vocational qualification (CAP) and this effectively restricted participation to those who had failed to achieve in full-time education. In 1987 apprentices could also gain a vocational *Baccalauréat* (US HS graduation). From 1993 onwards, apprentices have been permitted to work for and gain the full range of nationally-recognized qualifications which were previously only available in full-time education. This range includes qualifications at tertiary level (US Associate Degree) and university degree (US 4-year college) level. Currently around 15 per cent of young people enter apprenticeship programs in France.

In short, in all the countries considered here, apprenticeship makes a substantial contribution to the education and training of young people. Despite country differences in institutional and cultural context and in proportions of young people enrolled in apprenticeship, apprenticeship in Europe shares a number of defining characteristics as set out below in Table 1.

[4] NVQ Level 2 is the basic skill level required to operate in most occupations. NVQ Level 3 usually denotes skilled worker/artisan/junior technician level

Table 1 Common defining characteristics of apprenticeship programs in Europe

	Between 70 and 80 per cent of time spent in the workplace	Fixed duration of apprenticeship contract (3-4 years)	Statutory entitlement to off-the-job education and training	Externally-set examinations for award of apprenticeship certification	Completed apprenticeship leads to nationally recognized qualification
Austria	yes	yes	yes	yes	yes
Germany	yes	yes	yes	yes	yes
Switzerland	yes	yes	yes	yes	yes
Denmark	yes	yes	yes	yes	yes
France	yes	yes	yes	yes	yes
Netherlands	yes	yes	yes	yes	yes
UK	yes	no	no	yes	yes

Who enters apprenticeship?

There are no legally prescribed educational pre-requisites for entry to apprenticeship in the seven countries considered here. Nevertheless, in the dual system countries it is well-known that good school marks will open the door to a prestigious occupation or firm. The importance that firms attach to school marks means that young people in the dual system countries have an incentive to do as well as possible at school in order to have a chance of the apprenticeship of their choice.

Apprenticeship is not primarily seen as a way of providing for all those who leave school with modest or low academic grades. For the lowest attainers there are other preparatory courses or work-based programs.

While we know, for a number of countries, the prior educational level attained by those who enter apprenticeship, comparisons across countries of levels of qualifications held by apprentices are not sufficiently reliable to do more than provide some generalizations. In all countries, those with relatively low-level school grades at 16 are considerably over-represented in apprenticeship programs. Only in France (18 per cent) and Germany (15 per cent) do we find any significant proportion of apprentice entrants with qualifications which entitle them to enter university. (Ministère de la Jeunesse, Education et Recherche 2003b and Bundesministerium für Bildung und Forschung 2003a). In France, this is a very recent phenomenon which results from changes to apprenticeship regulations set out above allowing apprentices to gain the full range of state-recognized qualifications - thus expanding the supply to include those with good school achievements.

In the Netherlands, France and the UK, supply-led expansion has meant that numbers entering apprenticeship have either increased or stabilized. In the UK what is characterized as a 'quasi-market' in the provision of apprenticeship places in companies means that for-profit training companies contract with the government to seek out the required number of apprentice places in firms (Ryan and Unwin 2001). In France it is

accepted that the expansion in places has been driven largely by demand from young people. Principal incentives are

- higher employment probability in a highly competitive labor market
- possibility of financing study for nationally recognized qualifications while working
- linked apprenticeship contracts to enable study to degree level (Simon 2001).

In the dual-system countries (Austria, Germany and Switzerland) and in Denmark, apprenticeship is very substantially demand-led, that is, apprenticeships originate from employer willingness to offer places to young people within the statutory framework outlined above. Young people are expected to seek out an apprenticeship place and those that cannot find a willing employer normally seek some alternative way forward. [5] In the traditional model, firms meet the cost of on-the-job training requirements, apprentice wages and other in-company costs while government finances off-the-job vocational schooling. Employers who train receive some benefits through tax rebates but these are small in relation to overall costs. Young people are paid a training allowance set at roughly one third of the adult skilled rate for that occupation. This is negotiated at sector level through collective bargaining.

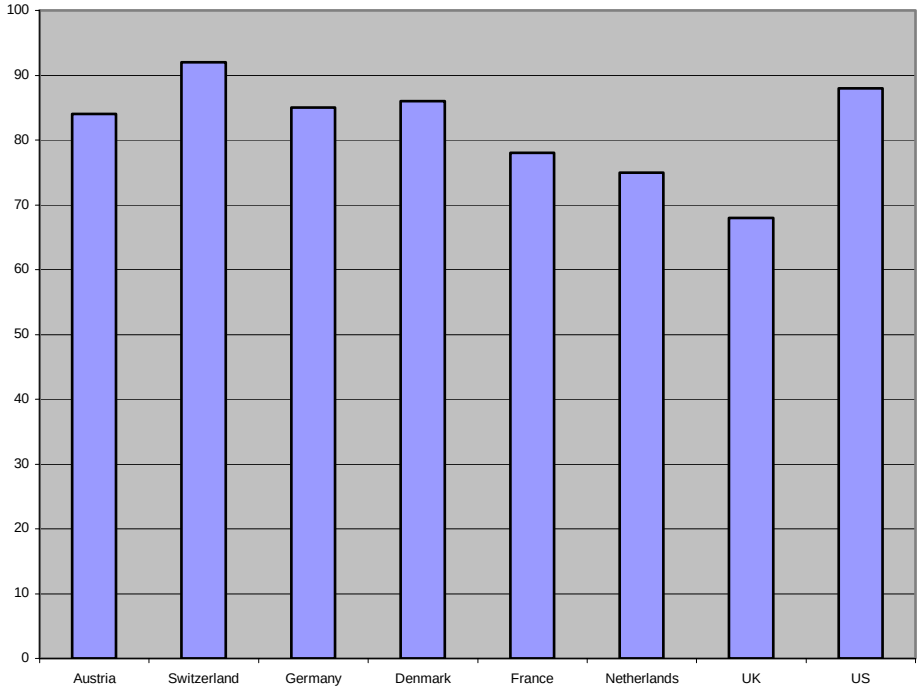
Section 2 Two models of apprenticeship: Employer commitment and 'separation' versus vertical integration providing access to tertiary level institutions

School attendance in Europe is normally compulsory until the age of 15/16. [6] Thereafter students enroll in different education and training courses dependent on inclination, aptitude and ability. Proportions who continue in education and training to at least age 18/19 vary, but normally at least two thirds of an age group will obtain an upper secondary qualification (which may include an apprenticeship qualification) and which may be considered equivalent to US High School graduation (Figure 1).

[5] In Germany and Austria those who cannot find places on a first attempt usually enter a pre-apprenticeship college course or some other form of pre-apprenticeship in order to improve basic academic attainments. Denmark falls somewhere between these two groups of countries (demand-led and supply-led): young people who cannot find an employer to offer an apprenticeship place are provided with work experience arranged by a vocational college.

[6] The exception is Belgium where school attendance is compulsory until age 18.

Figure 1 Population aged 25-34 with at least upper secondary qualification/education (HS graduation) 2001



Source: OECD *Education at a Glance* 2003 Table A.1 2

In the European countries examined here, at least half of those studying for qualifications at upper secondary level (US High School graduation) do so by following a vocational track (OECD 2000). The extent to which apprenticeship contributes to this track varies fairly systematically, depending on the model of apprenticeship in place. Although, as we have seen above, many of the principal elements characterizing apprenticeship in Europe are common to all the countries examined here, it is useful, in considering the current health and prospects of apprenticeship, to distinguish two models. This paper will argue that the challenges faced by apprenticeship in a changing social and economic context are, to some extent, a function of the model in place in the different countries.

This simple typology of European apprenticeship identifies two key parameters which are particularly relevant for the resilience of apprenticeship in the face of social and economic change. These parameters are

- the extent to which the provision of places is genuinely demand-led (high employer commitment) / supply-led (low employer commitment)
- the extent to which apprenticeship constitutes a separate track from full-time education (separation)/ offers opportunities to gain mainstream (full-time) education qualifications including access to university (US 2 year and 4 year college) (vertical integration).

Figure 2 below situates the seven countries examined here in relation to these two key parameters.

Figure 2 Demand-led apprenticeship (high employer commitment and 'separation') vs. supply-led apprenticeship (low employer commitment and 'vertical integration')

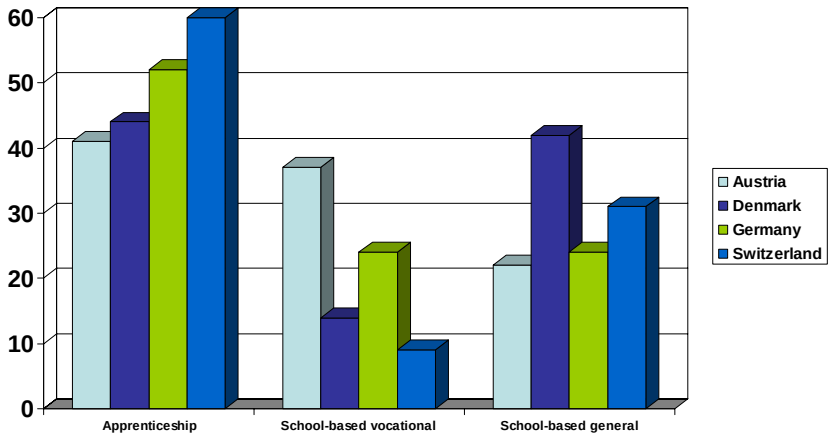
	Employer commitment high	Employer commitment moderate	Employer commitment low
Apprentices integrated into full-time education structures			France Netherlands
Some apprentice integration into full-time structures		Denmark Austria	UK
No apprentice integration into full-time structures	Germany Switzerland		

In the case of countries with high-moderate employer commitment (dual-system) apprenticeship – Austria, Germany, Switzerland and Denmark, apprentice places are a function of employer offer. Where employer commitment is low (France, Netherlands and UK) apprentice places are found as a result of approaches to employers by training providers and other intermediaries. Countries where commitment is low find it more difficult to induce talented young people to take up apprenticeship. This inducement can be provided by ensuring that qualifications leading to a university degree level can be obtained through the apprenticeship route as well as through the full-time vocational track (vertical integration). With these arrangements in place, it is hoped that students with good academic marks who opt for apprenticeship will not have to forego the opportunity of obtaining a university degree.

France, Denmark and the Netherlands have recently followed this route by situating apprenticeship within a wider framework of nationally-recognized vocational certification. This broadens the options of apprentices who can switch between full-time education and apprenticeship with full credit for qualifications acquired and thus continue to tertiary level study. While (except in France) it is still not common for apprentices in these countries to continue to higher education courses, crossover points to tertiary level vocational courses (equivalent to US Associate Degree) have been recognized and institutionalized. It is hoped that integration will attract a wider range of ability to apprenticeship and avoid the creation of an apprenticeship 'ghetto' for a small proportion of disadvantaged young people.

Countries in the demand-led high employer commitment area make little or no provision for apprentices to obtain qualifications available in full-time schooling (US High School graduation) and which lead on to university level (US 4-year college). In these countries, the apprenticeship route dominates education provision for 16-19 year olds (Figure 3).

Figure 3 Estimated distribution of upper secondary students by main education and training pathways after compulsory education (1996 or closest year)

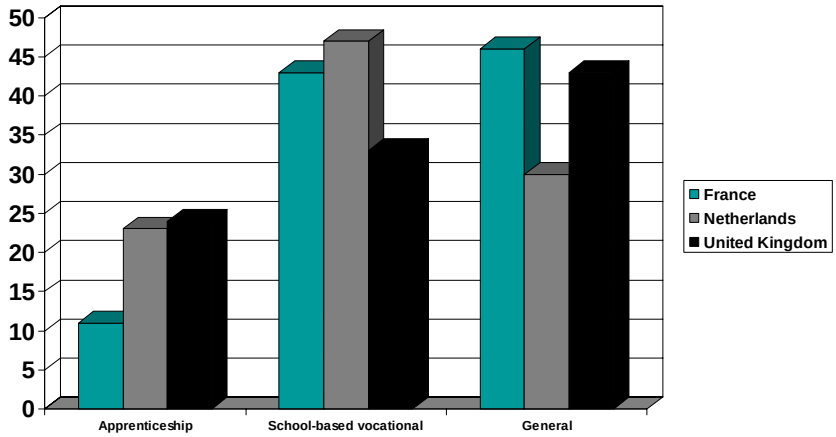


Source: OECD From Initial Education to Working Life Table 2.2

In all the countries with high/moderate employer commitment shown in Figure 3 (above) the school-based full-time vocational route is less frequently chosen than apprenticeship. In the case of the German-speaking countries (Austria, Germany and Switzerland), and, to a lesser extent Denmark, the school-based general (academic) route is also less frequently chosen than the apprenticeship route.

The situation in the countries with low employer commitment to apprenticeship (France, Netherlands, UK) is very different. Figure 4 again shows the distribution of 16-19 year old students between the types of education provision on offer. In the case of France and the UK, the general (academic) school-based route enrolls nearly half of all students still in education while in the case of the German-speaking apprenticeship countries less than one third took this route. Again, in contrast to the countries with high employer commitment, the proportion of students on the school-based vocational route far outweighs proportions on the apprenticeship route.

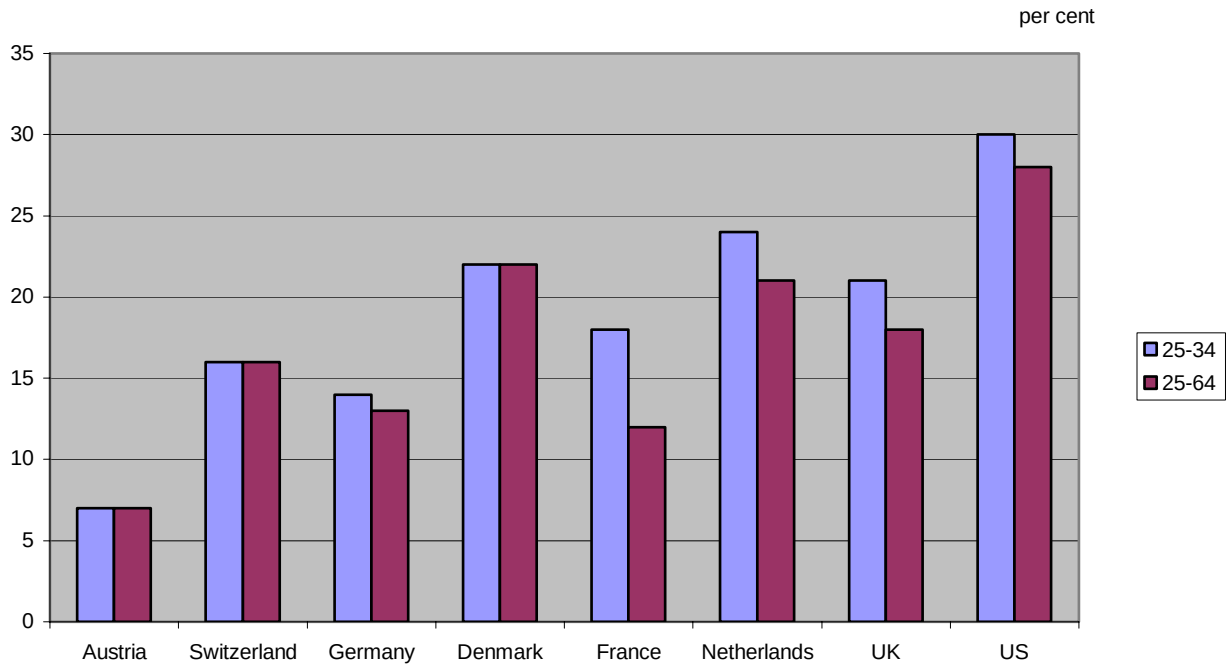
Figure 4 Estimated distribution of upper secondary students by main education and training pathways after compulsory education (1996 or closest year)



Source: OECD From Initial Education to Working Life Table 2.2
Note: For UK all forms of government-funded training included

This section has tried to show, in schematic form, the interaction between apprenticeship and the wider context of education and training provision. High employer commitment and integration appear to be substitutes rather than complements. Where employer commitment is high, apprenticeship attracts higher proportions of young people than either the school-based vocational or school-based academic route. We can observe that where there is no direct access to university courses for those with an apprenticeship qualification, demand for university degree education (US 4-year college) is low relative to countries where employer commitment to apprenticeship is low, and has shown little growth. Figure 5 (below) shows percentages of a young (25-34) age group with a 4-year college degree compared to the percentage for the whole adult population (25-64).

Figure 5 Proportions holding a first or higher university (US 4-year college) degree by age, 2001



Source: *Education at a Glance* Table A2.3 OECD 2003

Figure 5 shows that, for the countries with high employer commitment to apprenticeship – Switzerland and Germany – growth in proportions gaining 4-year college degrees has been negligible and qualification rates are lower than for the other countries examined. Austria and Denmark, characterized as having moderate employer commitment also show no difference between the age groups in proportions with college degrees. By contrast, the countries characterized as having low employer commitment to apprenticeship – France, Netherlands and the UK- show the younger age group more highly-qualified than the population as a whole. Where, as in these countries, college-going has been increasing it has become more difficult for apprenticeship to attract good-caliber students and this tends to lower employer commitment even further. The solution adopted by these countries (France, Netherlands and UK) has been to create greater permeability between the different types of educational provision 16-19 and to ensure that those choosing the apprenticeship route can gain qualifications needed for university entrance if they so wish without loss of credits gained. By contrast, the route through to university entrance from apprenticeship in Switzerland and Germany requires some additional years of study in full-time school.[7]

[7] Figure 5 refers only to what, in Europe, are known as first and higher degrees awarded by a recognised university. All the European countries in Figure 5 also offer a professional qualification similar to the US Associate degree and provided similarly in a Community College type environment. With the exception of Germany, it is becoming increasingly easier for apprentices in Europe to continue on to this type of tertiary level qualification, although additional study is required, in eg. Austria and Switzerland.

Section 3 Apprenticeship and transition from school to work[8]

A recent OECD study of the transition from school to work singled out the dual system apprenticeship countries of Europe (Austria, Germany and Switzerland) on the grounds that they promoted more favorable youth transitions from school to work than non-apprenticeship countries (OECD 2000). The OECD view was influenced in particular by the distribution of unemployment in the dual system countries where they found a lower probability of unemployment for under 25s relative to the rest of the population. More recent figures show that the advantage of the dual system apprenticeship countries identified by the OECD in 1998/99 persists to date (Table 2). We can also note from Table 2 that the 'supply-led, low employer commitment' countries (France, Netherlands and UK) have higher ratios.

Table 2 Youth (15-24) to adult (25-54) unemployment ratios, 2002

Austria	1.6
Denmark	1.92
France	2.25
Germany	1.18
Netherlands	2.27
Switzerland	1.96
United Kingdom	2.68
United States	2.5

Source: OECD Employment Outlook 2003 Table C

The ratio of unemployed youth to unemployed adults is, however, a fairly crude way of evaluating transitions. While Table 2 suggests that countries with high proportions of youth in apprenticeship have lower ratios in common, this does not permit conclusions about the possible role of apprenticeship in promoting these ratios.

However, a recent wide-ranging survey of the school to work literature concludes that apprenticeship does tend to increase the employment content of early working life, although effects on pay and promotion are less clear (Ryan 2001).

[8] As policy experiments (for example randomised allocation of young people to apprenticeship and non-apprenticeship) are not a practical option, the findings reported in this section are subject to the proviso that selection bias may constitute part or all of the explanation of the performance of apprenticeship in the school to work transition.

Direct comparison *across countries* of unemployment rates of young people – for example OECD (1993) - is subject to compositional effects arising from differences between countries in proportions of young people in full-time education at different ages (Ryan 2004a). Gangl (2003) overcomes this problem by constructing intra-country indicators of transitions from full-time education and training to employment using European Labor Force Survey data from 1992-1997. For each of 12 European Union countries, labor market outcomes for different types of school/work-based qualification including apprenticeship were plotted. Using four different indicators – unemployment, occupational status, low-skilled employment rate and professional employment rate – the outcome for completed apprenticeship can be observed for each country where apprenticeship is available. This study avoids the problems of inter-country comparison outlined above by providing a score for each qualification relative to other qualifications within each country. On the measure of low-skilled employment, differences emerge between countries in the extent to which apprentices are found in low-skilled employment. In Austria and the Netherlands apprentices are far more frequently found in low-skilled positions than in the other countries considered. Gangl also points out that unemployment rates of apprentices are frequently similar to leavers with tertiary level qualifications (US Associate Degrees).

Summarizing the descriptive data, Gangl considers that 'apprenticeships perform very favorably both compared to school-based education at the same level of training and across different qualification levels'. Apprenticeship also emerges positively from a multi-level modeling exercise designed to control for country differences. Gangl reports that after controlling for institutional and structural factors, 'apprenticeship [produces] a significant reduction of unemployment rates in early careers'. This study confirms the findings of Ryan (2001 op. cit.) and points to the conclusion that a completed apprenticeship qualification results in improved employment outcomes relative to other school-based qualification outcomes - but lower than employment rates for university graduates.

One of the principal reasons for relatively smooth school to work transitions in dual system countries is the superior matching of training to labor market demand that results from apprenticeship training being contingent on the offer from employers. In the former 'West Germany', just under two thirds of all German apprentices are taken on as employees by the firms that train them. In the former 'East', the proportion is far lower, just over 40 per cent. This matching is clearly not perfect and arises in part because a proportion of employers offer places more out of considerations of profitability (resulting from apprentice productivity substituting for unskilled labor) than from real skill need - hence the well-known overproduction in Germany of bakers, car mechanics and office clerks. However, this 'overproduction' can be viewed more positively in the light of research showing that, not only are German apprentices highly mobile after apprenticeship, but that mobility is also associated, in the majority of cases, with higher earnings (Euwals and Winkelmann 2002; Werwatz 2002).

Section 4 Apprenticeship under stress?

Sections 1 and 2 argued that apprenticeship in Europe provides an opportunity for skill acquisition by young people and also constitutes an integral component of secondary education provision in the countries considered here. But the institution of apprenticeship is also a private-public partnership which functions only when incentives to all the parties concerned – young people, employers and government – are sufficient to secure the desired levels of participation of all parties. In the post-war period this delicate balance has required frequent readjustment.

However, over the last decade changes in demand for skill as a result of technological innovation, new pressures on firms' business strategies and externally-imposed restraints on national government spending have created more serious challenges than those previously experienced. In this section, the effects of changing economic context and new educational trends on the supply of apprentice places and demand from young people are examined for both the demand-led and supply-led apprenticeship countries

The demand-led, dual-system countries (Austria, Germany and Switzerland)
Stronger competition on world product markets has increased pressures on firms' costs in these countries. As a consequence,and particularly in Germany and Austria, firms have found national labor market regulation which, among other things, provides incentives for participation by employers and young people in apprenticeship, increasingly burdensome (Streeck 1997).

Over the last decade it has proved more difficult to achieve the employer-apprentice match in dual-system countries compared to previous decades. This is not the result of firms formally raising their entrance requirements. Changes in the organisation of economic activity have raised firms' skill needs and the content and level of qualifications required. Firms claim that it has been increasingly difficult to find young people with the qualities and attributes that they seek (Bundesministerium für Bildung und Forschung 2004). But the capacities and potential of young people coming forward have also been modified by the recent increased probability that a young person will stay on in full-time education after the end of compulsory education and continue on to university study (US 4 year college).[9] In addition to this trend which has lowered the average ability level of applicants for apprenticeship, in Germany, educational standards appear to have declined as judged by results in successive international tests.[10] In combination with the more competitive economic environment which requires higher skill levels, this fall in quality of recruits raises the cost to firms of providing apprenticeship and, consequently, means that firms are more reluctant to recruit.

[9] The proportion of the relevant age groups entering university degree courses is 10 per cent higher than in 1998 and stood at 39.6% in 2004 (Berufsbildungsbericht 2004 - Teil I: Entwicklungstrends auf dem Ausbildungsstellenmarkt).
[10] In Germany, school pupils performed poorly in TIMSS (1996) and PISA (2000) relative to their performance on earlier international tests. For an exploration of these issues see Steedman and McIntosh (2001).

In order to maintain a supply of apprentice places sufficient to meet the demand, governments in these three countries have been obliged to increase the level of subsidy to support the additional places needed.

In Germany, during the prosperous 1980s, offers of apprenticeship places for young people regularly exceeded would-be apprentices and in 1985 apprenticeship places taken up were around 20 per cent higher than in 2003 (Wagner 1998). Since the early 1990s, coinciding with reunification in 1992, places offered have been barely adequate to meet the demand from young people. [11] In 2003 the proportion of places offered by firms fell for the third successive year and absolute numbers of places also fell (Table 3). The supply/demand ratio has only been maintained because of smaller age groups, financial subsidy from central and regional governments and the 'cooling-out' of applicants seeking to register interest in apprenticeship.

Table 3 Apprenticeship places by whether employer-financed or government-financed Germany 1999-2003 (percentage)

Year	Former 'West'		Former 'East'		Germany		New apprenticeship agreements (000s)	
	Employer financed	Govt. financed	Employer financed	Govt. financed	Employer financed	Govt. financed	Former 'West'	Former 'East'
1999	93.5	6.5	66.7	33.3	87.2	12.8	482	149
2000	95.9	4.1	73.1	26.9	90.8	9.2	483	139
2001	96	4	71.8	28.2	90.7	9.3	480	134
2002	95.2	4.8	69.5	30.5	89.6	10.4	447	125
2003	95.2	4.8	68	32	89.2	10.8	435	123

Source: Berufsbildungsbericht 2004 Übersicht 5

For Germany, from Table 3 it is clear that the regions of the former 'East' have experienced greater difficulty in providing apprenticeship places since reunification. Although dual system apprenticeship was in place prior to reunification, the training given was of poor quality and supply of places was not a function of market forces (Wagner 1998). The difficulties which have followed the replacement of this system by the West German model are not surprising given the collapse of manufacturing and the failure to grow jobs and the economy in these regions. In the former 'West', the problem is much less significant. Nevertheless, viewed in the context of substantial annual falls in

[11] The BiBB (Federal Institute for Vocational Training) recently admitted that annual statistics of demand and supply do not give anything like the full picture of the pressures on the system. As unemployment continues to rise in Germany, demand for places from young people who have been 'parked' in other forms of schooling waiting for an apprenticeship place or who are unemployed put additional strain on the system. These older would-be apprentices are estimated at some tens of thousands by the BiBB but, not included in the statistics presented annually by the German Ministry of Education and Training (Ulrich 2003).

both the former 'West' and the former 'East' in numbers of places offered by firms since 1999, the situation is now causing considerable anxiety in Germany.

In Austria, where apprenticeship covers a narrower range of more traditional occupations than in Germany, there was a marked decline in the supply of places in the late 1990s (Table 4 below). While, in the early '90s the supply of places outstripped demand, by the mid-90s the ratio of demand for places from young people to supply by firms was over 2:1 (Nowak and Schneeberger 2003). Improved financial incentives to firms have resulted in more training places being offered and the decline in participation in Austria has now leveled out. In 2003 a slight increase (1.8 per cent) in places offered was recorded. However, the government continues a policy initiated in the late 1990s of offering financial incentives to firms to offer places (€1000 per firm and per apprentice) in the form of tax rebates (Bundesministerium für Wirtschaft und Arbeit 2003).

The situation in Switzerland has also recently started to deteriorate although apprenticeship offers continue at a high level – over half of all 16 year olds are in apprenticeship (Table 4 below). However, the Swiss government, used to negligible youth unemployment, is concerned at a recent increase to 4 per cent of 15-24 year olds unemployed, up from .5 per cent in 1990. A recently introduced program to reduce youth unemployment includes subsidy of apprentice training places with the express aim of reducing youth unemployment (Eidgenössisches Volkswirtschaftsdepartement: State Secretariat for Economic Affairs 2005).

The supply-led, low employer commitment countries (France, Netherlands, UK)
It has been stressed (Section 1), that in the dual-system countries apprenticeship places are dependent on employer offer. The demanding requirements of the in-firm training programs imposed by the dual system have meant that, traditionally, larger employers incurred net training costs although smaller employers may break even (von Bardeleben et al. 1995). However, in the countries with low employer commitment to apprenticeship, requirements on firms to train apprentices in the workplace are lighter and often taken over by training providers or other organizations such as vocational colleges. Costs to firms are correspondingly lower. Finding apprentice places is therefore less dependent on the business climate and changing production requirements than in the dual system countries. In contrast to Germany, Austria and Switzerland, numbers entering apprenticeship in the supply-led countries have increased quite substantially during the 1990s (Table 4). However, proportions of the relevant age groups in apprenticeship remain well below those in the dual-system countries and also well below proportions choosing full-time vocational courses in vocational schools (Figure 4 above).

Table 4 First year apprentices, numbers and as a percentage of the 17 year old age group

thousands

	Austria[1]		France		Germany		Netherlands[1]		Switzerland[3]		UK[2]	
	First Year Apprentices	as % age group	First Year Apprentices	as % age group	First Year Apprentices	as % age group	First Year Apprentices	as % age group	First Year Apprentices	as % age group	First Year Apprentices	as % age group
1990	49[e]	48.7	73	9.3	546[a]	70	54[e]	22.8	n/a	n/a	n/a	n/a
1995	38[e]	39.5	98	12.9	573	n/a	n/a	n/a	60	59	50	8
2002	36	37.9	121	15.5	572	62	64[e]	32.2	67	59	110	17

Notes:
(1) Austria: 1992, 1996; Netherlands 2003
(2) England only
(3) The number of apprentices as a percentage of all 16 year olds is 75% for 1995 and 78% for 2002. However, a proportion of apprentices are older than 16 and numbers older than 16 have been increasing in recent years. The percentage in Table 4 is taken from a sample survey (BBT Lehrstellenbarometer 2004 Grafik 12.1) which provides an estimate of the proportion of all 16 year olds entering apprenticeship
(a) Germany 1990 former 'West' only
(e) estimate

Sources:
England: National Statistics and Learning and Skills Council Statistical First Release: ILR/SFR03; Steedman, Gospel and Ryan (op.cit.); Switzerland : Bundesamt fur Berufsbildung und Technologies (BBT) (2004) Berufsbildung in der Schweiz 2004: Fakten und Zahlen http://www.bbt.admin.ch/berufsbi/publikat/d/bbinfo_d.pdf
Lehrstellenbarometer 2004 http://www.bbt.admin.ch/berufsbi/projekte/barometer/archiv/d/lehrstellenbarometer_aug_04_d.pdf
Netherlands: Centraal Bureau for de Statistik (2005) Leerlingen en geslaagden mbo http://statline.cbs.nl; France : Ministère de la Jeunesse, de l'Education Nationale et de la Recherche (various years) Repères et Références Statistiques sur les Enseignements, la Formation et la Recherche; Austria: Bundesministerium für Wirtschaft und Arbeit (2003); Denmark: it has not proved possible to obtain statistics for Denmark; Germany: Berufsbildungsbericht 1997 and 2003 and Grund und Strukturdaten 1998

From Table 4 it can be seen that the dual system countries have continued to have high proportions of young people in apprenticeship but these have fallen or remained steady in recent years. In contrast to earlier decades, high proportions of young people in apprenticeship have only been achieved with the help of public subsidy. There is also evidence in these countries of an undercount of requests for apprentice places. By contrast, supply-led apprenticeship has proved more resilient and numbers in apprenticeship have increased or remained constant. However, apprenticeship in France, the Netherlands and the UK has to compete with the 'pull' from the general academic route and from full-time vocational education. There, the main preoccupation has been to prevent apprenticeship from becoming a low-ability 'ghetto' by improving its attractiveness to young people from a wider range of abilities.

Changing apprenticeship incentives: the dual system countries (Austria, Germany, Switzerland)

Positive incentives to young people to engage in apprenticeship in these countries rest to a large part on labor market institutions and regulation (Soskice 1994). One incentive to take on and complete an apprenticeship is the restriction, enshrined in many collective agreements, that access to technician and *Meister* (master craftsman) status is open only to those who have completed the relevant apprenticeship. In the *Handwerk* (artisan) sector, the apprenticeship certificate is a necessary condition for independent practice and apprenticeship followed by a period of full-time professional education is a recognised route to management in many industries. In addition, the stability of collective bargaining arrangements in Germany which negotiate the skilled/semi-skilled wage differential mean that a job in the occupation learnt in apprenticeship will lead to higher wages on the labor market.

In addition to these positive incentives, labor market regulations and education institutions add a negative incentive to participate. Firms are barred from employing young people under 18 in the wide range of occupations for which an apprenticeship programme exists. Similar conventions exist in Austria and Switzerland. Effectively, employment opportunities for under-18s are limited to unskilled occupations and only around 1 or 2 per cent of the cohort is in employment at age 16 or 17. Considered alongside the range of occupational training open to young people, this means that the youth labor market is of only very limited attraction to school leavers. The length of time normally taken to complete a university degree course (average seven years in Germany) and high university drop-out rate in the dual-system countries (including Denmark) deters some of the more academic school-leavers from applying to attend university degree courses (US 4-year college).

These incentives, both positive and negative, are under threat. Germany and Austria are under considerable pressure from the European Commission and from business and industry to dismantle restrictive labor-market legislation and introduce greater flexibility into the labor market, in particular into the process of collective agreement of working time and wage setting. If and when such changes are made, they may well reduce the incentives outlined above which currently encourage young people to participate in apprenticeship.

Since the late 1990s, Germany has been experiencing rapid growth in participation in university (US 4-year college) degree courses. At a time when firms claim to need better qualified entrants to apprenticeship, this further depletes the pool of suitable candidates (*Berufsbildungsbericht 2004*). In addition, fundamental change to the structure of university education in all European Union countries is likely to further affect the demand from young people for apprenticeship in both Germany and Austria. This change, the result of a process of negotiation which is usually dated back to the 1999 Bologna Agreement means that all the continental apprenticeship countries considered here apart from (non-EU) Switzerland have started to introduce 3 year degree courses leading to a Bachelor degree in place of the much longer and more demanding traditional university courses.[12]

Changing apprenticeship incentives: moderate/low employer commitment countries
The negative incentives to undertake apprenticeship, which currently arise from German labor-market regulation relating to employment in recognized occupations are not present in Denmark, France, and the Netherlands to the same extent. However, the desire to situate apprenticeship within a wider offer of vocational qualifications leading to ISCED levels 3/4 (High School graduation and Associate Degree level) poses its own threat to apprenticeship. As the popularity of full-time routes to vocational qualifications expands, apprenticeship prepares for an increasingly limited range of low-status occupations. This has been the outcome in the Netherlands and Austria, confirmed by Gangl (2003) who notes a particularly high probability of lower-skilled employment for apprentices relative to those with vocational qualifications from full-time upper secondary school for Austria and the Netherlands.

For many years the number of apprentices in France remained small (225,000 in 1980) mostly in artisan trades and occupations. However, since a number of changes were made to the laws governing apprenticeship in 1983, 1987 and again in 1993 - including

[12] This is often referred to as the Anglo-Saxon model and is mainly derived from the UK model of 3 year Bachelor degrees followed by one or two year Master degrees and 3 year PhD duration.

allowing apprentices to obtain the whole range of educational qualifications up to and including Master degrees, apprenticeship has expanded dramatically (Table 4 above). In contrast to the dual system countries, the quality of apprentice recruits has improved and the share of entrants aiming for the most basic qualification level (CAP) is declining (Ministère de la Jeunesse, Education et Recherche 2003a).

In the Netherlands, numbers in apprenticeship continue to increase, part of a wider trend of expanding upper secondary vocational education (Ministry of OCW 2004 and Table 4 above).

The proportion of those enrolled in education (16-19) who are in apprenticeship or related vocational programs in Denmark has remained stable at just over 50 per cent between 1997 and 2002 (Denmark's Statistical Yearbook 2004).

Section 5 Conclusions: can apprenticeship in Europe adapt and survive?

This paper considers the current position of apprenticeship in seven European countries, Austria, France, Denmark, Germany, the Netherlands, Switzerland and the UK. Apprenticeship provides the education and training path for two thirds of school leavers in Germany and Switzerland; in the remaining countries between a third and a fifth of leavers take the apprenticeship route.

Apprenticeship in Europe is analyzed here as two models sharing common characteristics but with different degrees of employer commitment and difference with regard to integration with mainstream (full-time) vocational education and giving access to tertiary level qualifications.

The great strength of apprenticeship in the dual system countries with high employer commitment and low integration (Austria, Germany and Switzerland) is that it is predominantly driven by employer demand with training programs that are strongly influenced by employer input. However, responsiveness to employer skill needs has required the maintenance until now of rigorous separation of the apprenticeship route from the full-time academic education route. Whereas a small percentage of those who take apprenticeships have already gained the qualification giving access to university degree courses (US 4-year college), for most apprentices in dual system countries there is no easy way to switch from apprenticeship to courses leading to university degree.

In Denmark, France, the Netherlands and the UK (the 'vertical integration' countries), apprenticeship plays a less central role in educating and training young people than in the dual system countries. Full-time vocational education predominates in preparation for labor market entry. Denmark, France and the Netherlands have remodeled and adapted apprenticeship structures to achieve a degree of stability and 'fit' with modern labor market conditions. Training program requirements for employers taking apprentices are less demanding and therefore less costly than in the dual system countries. Where employers do not voluntarily come forward to offer apprenticeship places, training providers will actively procure places on behalf of young people. The prospects for maintaining an apprenticeship offer for young people in these countries appear good, since recent years have shown modest expansion. In the UK, where there is no statutory requirement on apprentice employers to offer day release for off-site education it is still proving difficult to reconcile flexibility and responsiveness to the needs of employers with high skill standards for apprentices consistently applied across all sectors. The establishment of apprenticeship in the UK as a high-quality program developing high skill standards is still problematic (Ryan 2004b).

The strength of the dual system is also its weakness. It is vulnerable to cyclical economic fluctuations, structural problems in and shocks to the economy. In Germany, the reunification shock will be felt for years to come through its effect on the supply of apprenticeship places. In recent years employer demand for more broadly-based training to respond to changing economic conditions has increased and institutional changes to the dual system have not kept pace. In Austria, and to a lesser extent in Germany, the balance between high value-added apprenticeships in large companies and low value-added apprenticeships in smaller companies is changing as demand for apprentices in large high value-added companies falls as a proportion of all places. In Austria and Germany the dual system maintains the outward appearance of health thanks only to government subsidy. In Switzerland, there are signs that the same process may also be at work, although on a much smaller scale. Labor market reform and reform of higher education in both countries threaten more change to existing incentive structures for both employers and young people. Insulated from the shocks that have assailed the dual system in Germany and Austria, but nevertheless exposed, as they are, to competition from low cost manufacturing capacity in other countries, apprenticeship in Switzerland now shows signs of strain.

The bottom line for the survival of the dual-system in a more competitive environment is reducing employers' costs while maintaining training quality in modernized training programs. Is this a realistic expectation? Previous studies of the cost of apprenticeship to employers found that almost all employers reported high net costs (Noll et al. (1983) and

von Bardeleben op.cit). Wagner (1998) argues that costs may be offset by savings elsewhere, particularly savings in recruitment costs and avoiding the costs of poaching workers. Recent research using a different methodology from Noll and von Bardeleben suggests that employers' net costs may previously have been overstated. Research using firm level data from Switzerland suggests that the high offer of apprentice places in Switzerland can be explained by the efficiency with which firms manage to recoup training costs through the productive deployment of apprentices during the training period (Wolter, Mühlemann and Schweri 2003). For Germany there is evidence from the latest study of training costs to employers that efficiency is improving there as well and that training costs are being reduced without any significant sacrifice of quality (Beicht and Walden 2002). If this trend can be continued and extended it may be possible for employers to achieve cost-effective training in apprenticeship combined with the higher quality more flexible training needed to meet changing market conditions. An example of rapid development of successful apprenticeship in a new business sector can be found in the German information and communication technology (ICT) industry. In this industry, where there was no tradition of apprenticeship, a flexible apprenticeship tailored to firms' skill needs was introduced in 1997 in response to firms' skill shortages. By 2001 60,000 apprentices were in training in the sector (Steedman, Wagner and Foreman 2003).[13] Apprenticeship may still be challenged, however, by the increased attractiveness of the new shorter university degree courses on offer in German universities.

While apprenticeship continues to provide for the education and training of more than half of all young people in Austria, Germany and Switzerland, the need for government subsidy of apprenticeship in recent years also indicates that the dual-system is experiencing stress, particularly in Germany and Austria. Calculations based on 2003 led the German federal government to fear a substantial short-fall in 2004 in apprentice places provided by German companies. To alleviate this problem in the short term, the German government achieved an agreement with trade union and employer organizations (signed June 2004) which commits employers to offering sufficient apprentice places to meet demand over the next three years.[14] The latest information from the German Ministry of Education (Berufsbildungsbericht 2005) claims that this pact is having the desired effect and reports an increase in the total number of apprenticeship places

[13] The development of these new apprenticeship occupations was widely perceived as a test of the 'innovative potential' of the dual system. It was claimed that the concept of *Beruf* could be redefined as a dynamic process-oriented qualification that would allow employees to adapt to the rapid pace of change and highly competitive environment of ICT activity (Ehrke, 1997; Schelten and Zedler, 2001).

[14] Nationaler Pakt für Ausbildung und Fachkräfteanwuchs 2004 (National Pact for (apprenticeship)training and increase in skilled labor).

available and an increase in employer-provided training places over 2004, the first increase since the year 2000 (Table 3).

However, in addition to cost containment for companies, the longer term challenge if the dual system is to survive on something like its present scale is to speed up the process of adapting dual system training programs to fast-changing labor market requirements. This is the responsibility in the first instance of the Federal Governments in Germany, Austria and Switzerland. In Germany, a new Vocational Training Act,, the first since 1969, became law in April 2005. The Act makes provision for a lightening of bureaucratic procedures for employers, a more rapid modernization of existing training programs to ensure that they meet new employer skill needs and a focus on apprenticeships in new technology industries and services (Bundesministerium für Bildung und Forschung 2005)

Can dual system apprenticeship as found in Austria, Germany and Switzerland survive? Or will increasing public subsidy and the 'pull' of university degree courses lead it to progressively conform to the model found in Denmark, the Netherlands, France and the UK? For the survival of the dual system, it must be stressed that in Austria, Germany and Switzerland the system still enjoys strong employer and trade union support and strong demand from young people. Government in all three countries is pro-active in reshaping the statutory framework to promote modernization. The example of the ICT sector shows that, with sufficient employer commitment, the dual system model can be adapted to new skill requirements and work organization and can attract high quality entrants. Declining age cohorts will provide a breathing space for the system in the short term and may provide sufficient breathing space for cyclical downturn to work through and for the changes proposed in the German Vocational Training Act of 2005 to have the desired effect. These changes are designed to address the challenges to apprenticeship of structural change in the German economy. If they do not succeed, the future of apprenticeship in the dual system countries is doubtful.

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