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**The German Apprenticeship  
System after Unification**

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## **Abstract**

The vocational training system is an important factor within the German institutional framework. Its high output of skilled and well-educated employees provides a basis for Germany's export success and innovation. In the last few years, however, growing concern has been expressed about the viability of the German model. Globalization, the appearance of new forms of work organization and a rapid growth in net training costs are increasingly seen as a challenge. These factors together with the impacts of the transfer of the apprenticeship training to East Germany are discussed, the attractiveness of the system to school-leavers as well as for employers is analyzed and proposals for reform are developed.

## **Zusammenfassung**

Das duale System führt zu einer umfassenden beruflichen Ausbildung für die Mehrheit der Schulabgänger und stellt daher einen bedeutenden Faktor der institutionellen Rahmenbedingungen für die deutsche Wirtschaft dar. Die intensive Ausbildung der Beschäftigten bildet eine Basis für die Herstellung hochwertiger Güter, die zu Exporterfolgen der Wirtschaft führen und die Innovationserfolge der Unternehmen stützen. In den letzten Jahren werden jedoch Bedenken laut, ob das "deutsche Modell" überlebensfähig ist. Die Globalisierung der Unternehmen, neue Formen der Arbeitsorganisation, der Anstieg der Nettoausbildungskosten und die Rezession lassen Zweifel an der Attraktivität des dualen Systems für die Unternehmen, aber auch für die Schulabgänger auftreten. In dieser Studie werden Gründe für den Ausbildungsrückgang untersucht, die Ausbildungssituation in Ostdeutschland betrachtet und Vorschläge für eine Reform der Berufsausbildung entwickelt.

## Table of Contents

	page
1. The Importance of the Vocational Training System for the German Model	1
2. Searching for the Break-Even Point in Apprenticeship Training	3
2.1. Gross Costs	3
2.2. Net Costs	4
2.3. Variable Net Costs	5
2.4. Further Training Benefits	6
2.4.1. Additional Flexibility	6
2.4.2. Savings in Recruitment Costs	6
2.4.3. No Adaptation Costs for Newly Hired Workers	7
2.4.4. Avoiding the Costs of Poaching workers	7
2.4.5. Hiring people who fit	8
2.4.6. Reputation of Training Companies	8
2.5. Conclusion for the Break-Even Point in 1991	9
3. Cost Increases in the 1990s	9
3.1. Weekly Working Time Reduction	9
3.2. Broader Training Requirements	10
3.3. Increased Time for Vocational Schooling	10
3.4. Higher Training Wages	11
4. The Problems of Unification and the Recession	12
4.1. Transfer of the Apprenticeship System to East Germany	12
4.2. Supply and Demand for Apprenticeship Places in East and West Germany	13
4.3. Increase in Unemployment	17
4.4. Reduction in Training	19
5. Measures to Ease the Strain on the Apprenticeship System	21
5.1. Increasing Attractiveness of the Dual System to Companies	22
5.1.1. Designing Apprenticeship Occupations for New Markets and Updating Existing Qualifications	22
5.1.2. Cooperation Among Companies	22
5.1.3. Training Centers	23
5.2. Attractiveness of Apprenticeship for School-Leavers	23
5.2.1. The Apprenticeship Exam - a Milestone for Semi-Skilled Workers	23
5.2.2. From Skilled Worker to Manager	24

		page
5.2.3.	Equivalence of General and Vocational Training	25
5.3.	Creating More Training Places	26
5.4.	Reducing Costs	26
6.	Conclusions	27
References		30
Table 1	Gross Training Costs for Different Sectors and Training Years in DM in 1991	4
Table 2	Net Costs of Training in the Industry/Trade and Craft Sector according to Training Year in 1991	5
Table 3	Variable Net Costs of Training According to Company Employment Size in 1991	5
Table 4	Increase in Weekly Lessons at Vocational Schools in West Germany	11
Table 5	Supply and Demand for New Apprenticeships (in thousands)	15
Table 6a	Apprenticeships in Different Industry Sectors and New Contracts in West Germany since 1970 (in thousands)	16
Table 6b	Apprenticeships in Different Industry Sectors and New Contracts in East Germany since 1991 (in thousands)	16
Table 7a	Employment in West Germany according to Sectors, Unemployment Rate and Short Term Workers in Mechanical Engineering since 1991	18
Table 7b	Employment in East Germany by Sector, Showing Short Term Workers and Unemployment Rate since 1991	18
Table 8	Unemployment and People not in 'Regular' Employment in 1996	19

	page	
Table 9	Apprentice Training Ratio (Apprentices to Employees) According to Plant Size in West Germany in 1990 and 1995	20
Table 10	Percentage of Plants with Apprentice Training According to Industry in West Germany	21

## 1. The Importance of the Vocational Training System for the German Model

The German system has long combined a high level of competitiveness in world markets with a strong social cohesion that fosters low levels of inequality in a high wage economy. This framework depends on a set of socio-economic institutions - including banks, employer associations, and trade unions - that support long-term commitments by labor and capital. One important factor within this institutional framework is the vocational training system, which is seen by many authors to play a key role in Germany's comparative advantage in the production of high quality, internationally competitive manufactured goods through 'diversified quality production' (DQP), which is based on highly skilled craft workers and engineers (Sorge and Streeck 1988, Streeck 1995, Soskice 1997). Its high output of skilled and well-educated employees is also seen to provide the basis for Germany's export success and innovation (Carlin, Glyn, and van Reenan 1996; Kern 1996; Wagner, O'Mahony, and Paulsson 1997).

In the last few years, however, growing concern has been expressed about the viability of the German model. Globalization and the appearance of new forms of work organization are increasingly seen as a challenge (Streeck 1995). In the late 1980s new models of production were developed, and the training system began to be adapted (Kern and Schumann 1984). The new training structures have been updated and broadened so that the curricula contain improved technical content and require training in social competencies. Even with these changes, the German skill creation system in the 1990s has to adapt to new challenges, such as lean production, with its emphasis on team work, continuous improvement processes, flexible machine tools, close supplier relationships, and rapid innovation. Case studies show that the skills provided by the dual system along with the subsequent *Meister* training continue to be relevant in the new organizational context (see Finegold and Wagner in this volume). However, the restructuring of the curricula have placed a greater burden on the shoulders of the employers by increasing their net training costs. A strong increase in the apprenticeship allowance at the beginning of the 1990s has further added to the cost of training. If employers investing in the vocational training system - as in other business processes - are to obtain an adequate return on their investment, then measures to reduce their net training costs are needed. The balance between the costs and benefits of training will be the first major point discussed in this chapter.

While the German training system might be coping with new forms of work organization, two further problems have affected the sustainability of the system: unification and a severe recession. The recession, which began in 1991, induced an unprecedented loss of jobs in manufacturing industry, and export performance has deteriorated sharply. Although the German economy is slowly recovering from the economic slump, many companies are still

trimming their work forces and outsourcing more abroad, particularly in Eastern Europe. With the reduction in their overall employment, employers do not see a need for hiring new workers and thus refrain from offering apprenticeship places. This leads to a strong reduction in the supply of apprenticeship places, which is the backbone of the German training system. If supply does not cover the demand for training places, young people will not be trained, and the high skill strategy of the German system might fail. The balance between the supply and demand for training places will be the second major issue dealt with in this chapter.

The third topic is the transfer of the West German training system to East Germany.<sup>1</sup> At the time of unification, West Germany was one of the world's most successful and high wage economies (Streeck 1995). After unification almost all West German institutions - and with them the high-skill, high-wage model - were transferred to East Germany. Trade unions and employer associations agreed to raise East German wages to West German levels within five years to protect the existing high-skill high-wage system of the West. Accordingly, wages soared in East Germany, while productivity lagged behind (Hitchens, Wagner, and Birnie 1993). The skills of East German workers were lower than those of West German workers, and technology was also in need of modernization. As a result, East Germany was not prepared to compete in highly-skilled, high quality markets (Wagner 1993, Wagner et al. 1995). Even with subsidies and training initiatives, the updating of skills and the efficient use of modern machinery will inevitably take a long time. In addition, the traditional market of the East German economy was the Eastern bloc, which did not require and could not afford to pay higher prices for better products. Hence these markets broke away, and the Eastern manufacturers had to get into new markets which were already occupied by their West German counterparts or by other advanced producers. The consequence was a widespread collapse of East German manufacturing. Although each year more than 100 billion DM are transferred to subsidize the East German economy, a basis for self-sustaining growth has so far not been established (Carlin and Soskice 1997). The effects of the dismal economic situation on the supply of apprenticeships will be the third major topic of the chapter.

All these issues show the need for reform. Since the apprenticeship system is the major provider of vocational skills, the German model of high quality production is highly dependent on it. It provides the comprehensive theoretical and practical training through the "dual system" for about 70% of German young people. Because of its central role, the growing debate - about whether the apprenticeship system is in need of reform - is quite controversial (Althoff 1994, Dybowski et al. 1994, Degen and Walden 1997). On the one hand, some fear that the demand for places will drop and criticize the fact that the dual system is not attractive enough for good school-leavers, losing too many of them to higher education. A large number of small companies (with up to 99 employees) are unable to fill their offered training places (Lenske 1997).

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<sup>1</sup> East Germany here stands for the new federal states of the former German Democratic Republic (GDR); West Germany stands for the old federal states of the Federal Republic prior to unification.

On the other hand, it is argued (particularly in East Germany) that there is a surplus of would-be apprentices, and that the dual system will be decreasingly able to accommodate all applicants (Althoff 1994, Rüttgers 1996, Himmelreich 1996, Franz and Zimmermann 1996). Trade unions and the socialist party therefore demand that the system - which has worked up to now on the basis of completely voluntary participation by employers - should be financed through a levy scheme in the future. This proposal was put forward in the 1980s to accommodate the large increase in the number of young people seeking apprenticeship places, but has always been strongly opposed by employers, who claim that it will increase costs and lead to ineffective training. This chapter will seek to help to resolve the above controversial arguments, concluding with a set of measures to modernize the system.

## **2. Searching for the Break-Even Point in Apprenticeship Training**

### **2.1. Gross costs**

Since G. Becker's seminal work on human capital (1964), the incentives for investing in firm-specific and general skills have acquired special interest. Employers in the dual system provide both types of skills and detailed surveys into the costs and benefits of the apprenticeship system have been conducted (Edding 1963, Noll et al. 1983, Falk 1982, von Bardeleben et al. 1991 and 1995). These studies show that German employers incur high gross training costs, which differ according to the size of firms, the type of apprenticeship, and the training year of the apprentice. The latest survey for 1991 found average yearly gross costs in the industry/trade occupations of 31,800 DM, and 24,900 DM in the craft sector; costs in the craft sector were thus on average about 20% lower than in the industry/trade sector (v. Bardeleben 1995). Gross costs are defined as personnel costs of the trainer while he or she teaches, wage costs of the trainee, and overhead costs. The study also shows that training costs of large firms, where the first two years of training is often conducted almost entirely in training workshops, are much higher, at 42,000 DM per apprentice. Small and medium sized enterprises, which do their training mainly on the shop-floor, report much lower gross costs. The difference in costs according to the size of companies is partly reflected in Table 1, as industry/trade companies are on average larger than craft companies.

Table 1: Gross training costs for different sectors and training years in DM in 1991

	Industry and Trade			Craft sector		
	total	trainee wages as % of all costs	costs for the trainer in %	total	trainee wages as % of all costs	costs for the trainer in %
1st year	31,994	45.5	42.8	24,830	38.6	50.8
2 <sup>nd</sup> year	33,102	49.3	38.2	26,254	45.9	46.3
3 <sup>rd</sup> year	31,624	55.3	32.5	25,518	51.7	37.7
average	31,824	50.0	37.7	24,889	45.4	43.7

source: von Bardeleben et al. 1995

Costs over the different training years do not vary greatly. While the wage costs for the apprentices increase over time and therefore make up a larger portion of total costs, the costs for trainers decrease at a similar level. The sum of wage costs for the apprentice and for the trainer account for almost 90% of the total costs of apprenticeship training in each of the three years.

## 2. 2. Net costs

Net costs are more difficult to assess, because the productive output of the apprentice is usually not systematically measured. In the above survey, net costs were calculated as gross costs minus the productive output of the trainee, which was equated to the wage costs for a skilled worker while he was producing the same output. These net costs were found to be about a third higher in large than in small companies. Net costs in the *Handwerk* sector, at 12,352 DM are considerably lower than in the companies that belong to the chamber of industry and trade, at 20,509 DM, as shown in table 2. Average yearly net training costs are 17,862 DM. These figures take into account a yearly output of 11,710 DM per apprentice (von Bardeleben et al. 1995). A comparison over the training period illustrates an increase in the productive output of apprentices as they advance from the first to the third training year, when the trainees are already quite skilled and spend a higher proportion of their time in real work settings. Accordingly, net costs decrease, while gross costs remain stable (see Table 2).

Table 2: Net costs of training in the industry/trade and craft sector according to training year in 1991

	Industry and Trade			Craft sector		
	gross costs	productive output	net costs	gross costs	productive output	net costs
1st year	31,994	9,008	22,986	24,830	9,338	15,492
2nd year	33,102	11,036	22,066	26,254	12,020	14,234
3rd year	31,624	14,573	17,051	25,518	16,327	9,191
average	31,824	11,315	20,509	24,889	12,536	12,352

source: Von Bardeleben et al. 1995

## 2. 3. Variable net costs

Another way to estimate the costs of training is to look only at the variable costs. This calculation differs from the full cost method in that fixed costs are not considered, but only the costs which are directly associated with the apprentice. The costs of trainer supervisors, who instruct apprentices as part of their wider job responsibilities, mainly at times when they are not busy with production themselves (in contrast to full-time trainers), and the costs of administration, which barely increase with the intake of an apprentice, are omitted.

Table 3: Variable net costs of training according to company employment size in 1991

average	up to 9	10-49	50-499	500+
6,339 DM	1,646 DM	3,609 DM	8,184 DM	17,886 DM

source: von Bardeleben et al. 1995

Using this method the average net costs to companies are reduced to just 6,339 DM per apprentice (see Table 3). A large variation, which depends very much on the organization of training in the firm, is again evident among companies of different sizes. Where training takes place predominantly on the job, as often happens in very small companies, variable net costs amount on average to just 1,646 DM. Companies with more than 500 employees - which frequently train in training workshops with full-time trainers (and full trainers' cost) - have more than ten times that net cost: 17,886 DM. With this method, which seems to match real costs more accurately, the variable net costs are

negative for almost 20% of the trainees in the industry/trade sector and for 30% of trainees in the craft sector. It should be emphasized that a) the training for some companies pays off immediately over the training period (without even considering further benefits) and b) higher benefits than net costs are not restricted to the craft sector, as is often assumed. The overwhelming cost item are wages, which often account for about 80% of the total variable net costs. Consequently, the level of wages has a large impact on the level of training costs.

## 2.4. Further training benefits

### 2.4.1. Additional flexibility

In addition to the above estimated direct output of trainees, the benefits from employing an apprentice are often greatly underestimated. First, benefits are usually calculated only for those specific time periods during which apprentices are productive. Any corresponding slack times, such as waiting times that would occur if a skilled worker did the job, are not taken into account. Second, the added flexibility which an apprentice provides to the organization just by being available when a task comes up is often not considered. For example, she will answer the phone or take orders from customers at the time when they come in. For these tasks only her time spent taking the order is assessed as a benefit. However, if she were not there, another person would be needed to occupy the office full-time although this capacity would not be fully utilized. The same is true for occupations where some of the tasks can only be handled by two people.

### 2.4.2. Savings in Recruitment Costs

Companies that hire skilled workers from the market instead of training apprentices have to pay costs for advertisements, screening applications, doing interviews at different levels, and travel costs. These costs have been estimated by a large German company to reach 2,000 DM to 3,000 DM per hire (Cramer and Müller 1994). If the hired person fails to fit the job, then these costs will be incurred again in seeking a replacement worker. While there are also costs involved in recruiting apprentices, these are usually much lower as travel costs usually do not occur, there is no need for advertising since apprentices apply themselves or come from schools with close relations to a given company and it is less costly to test their skills since they will learn them on the job, and usually one person is sufficient to conduct the interviews.

### 2.4.3. No adaptation costs for newly hired workers

Newly hired people, even if they are skilled, need quite some time to acquire company-specific skills. Interviews in mechanical engineering firms have shown that newly hired people need between half a year and one year before they can work with full proficiency, depending on their qualifications, personalities, and their new jobs (Cramer and Müller 1994). If it is assumed that highly skilled people work during this time on average with half the productivity of a skilled worker fully adapted to the firm, the average loss in performance would be 27,000 DM, assuming average yearly wage costs of 54,000 DM in 1991. This loss is high if compared with the average net variable costs for apprentice training of 6,339 DM per year and it is still 1.5 times the net variable costs of apprenticeship training in establishments with more than 500 employees. When a semi-skilled person is hired to be trained for a skilled job, even higher costs might be incurred, since training takes a much longer time and the output foregone is higher as well. Companies that have tried to introduce a team organization with a semi-skilled workforce have found that the higher demands on the workforce require an enormous amount of new training. To overcome these difficulties they have decided to take on more apprentices in the future (Finegold and Wagner 1998, this volume).

During their first two years, newly skilled workers are paid the "young" skilled worker's wage. As about 50% of the apprentices remain with their training company for at least two years after the apprenticeship, companies gain additional benefits in comparison to hiring an experienced skilled worker (*Berufsbildungsbericht* 1993). In larger companies the proportion of former apprentices remaining in the company - and therefore the benefit - is even greater. Many apprentices like to stay with their company for one or two years after completion of their training, since training is not seen as being completed with the taking of examinations. After these years, the trainees as well as the employers of smaller or medium sized companies regard a change in firm as an advantage for the technical and social development of young people. This move is positive for the apprentices, as it adds to their know-how about production processes, products, and work organization, which differ greatly among establishments (Kloas 1988). It is also positive for the companies that hire them, since they bring new ideas and methods into the company and help to diffuse new working practices and technology. However, apprentices who leave their training company directly after their exams are often regarded with distrust. The potential new employer might suspect that the person was not hired by the training company because of some negative aspects in his/her apprenticeship.

### 2.4.4. Avoiding the costs of poaching workers

Companies that poach skilled workers from other companies have to offer higher wages to entice workers to leave their current companies. If they have to pay 10% to 15% more than the average wage, it amounts to an additional

5,000 DM to 7,500 DM per year. Usually the higher pay for these newly hired people cannot be kept secret, and other employees will demand a comparable increase as well. Over time non-training companies will therefore face considerable additional wage costs (Soskice 1994).

#### 2.4.5. Hiring people who fit

The risk of hiring a skilled person who does not fit the job, the team, or the company culture is much higher than hiring an apprentice who has been educated for over three years in the firm and whose personality and technical skills are well-known. Nearly three-quarters of the companies mentioned this consideration as an important advantage in training apprentices in the 1991 survey (v. Bardeleben et al. 1994). With the increasing introduction of team work and closer cooperation, the personality factor will become even more critical. The pressure to hire the right person, and hence the benefits from the lengthy screening period apprenticeships provide, is particularly important in Germany, given the relatively high cost and difficulties of firing employees.

#### 2.4.6. Reputation of training companies

The willingness to train also affects the reputation of companies, both internally and externally. The large proportion of German employees who have gone through an apprenticeship know from their own experience how important training is for young people. For them it is hard to understand why their company should not give this opportunity to young school-leavers. In addition, employees are often looking for apprenticeships for their own children and expect that companies might offer training places to them. Large companies are well aware that offering apprenticeship places can improve their external reputation. Their annual reports almost always include long accounts of their training activities. They invest a lot in the quality of training so that their trainees score well on their exams. This can provide them with free advertising if their trainees are awarded a top mark by the chamber, which is reported in the newspapers and business magazines; many German readers associate well-trained people with high quality goods. The correlation between training and reputation has recently been used in press releases of the ministry and of the chambers to increase the willingness of companies to train by publicly disclosing the names of those companies that do not train.

## 2.5. Conclusion for the break-even point in 1991

According to the above cost calculations the German apprenticeship system has been very finely balanced; for many companies costs and benefits were nearly equal until 1991. Although costs vary according to sector, size of company, and occupation, many companies, especially smaller ones which do the bulk of training, might have come close to a break-even-point, or even have achieved a net gain from training apprentices. For larger companies, variable net costs are much higher, but so too are the benefits after training. First of all, these companies have a choice among the better educated school-leavers, who prefer larger companies because of their better career prospects and greater fringe benefits. The larger firms apply more rigorous selection criteria in hiring school-leavers for apprenticeships. Thereby they ensure that they get very able apprentices who will fit the job, integrate well into the company, and who will not drop out of training. This helps insure that training costs are not wasted. Since the machinery in large manufacturers is usually more specialized, more delicate, and more expensive, a longer training period for newly hired skilled workers would be necessary; this makes it more worthwhile to train apprentices, who will then provide exactly those specific skills which are essential (Neubäumer, 1993, *Berufsbildungsbericht* 1992; Schöngen and Westhoff 1992). This is supported by the higher retention rate of apprentices in large companies. In addition, training costs are tax deductible; with the higher tax rate of larger companies, the after tax cost of training apprentices is further reduced.

## 3. Cost Increases in the 1990s

### 3.1. Weekly working time reduction

For many years West Germany has had one of the lowest number of yearly working hours per worker of any industrialized country. In addition to about six weeks of vacations plus public holidays plus paid sick days, the average working hours per week are decreasing. This trend is well illustrated in the metal industry. At the beginning of 1980 the standard working time was 40 hours; a progressive decrease took place until a 35 hour week was agreed on in October, 1995. While this decrease of 14% in working time affects workers and trainees in the same way, the time for productive work of the apprentice was squeezed. Given that the trainee needs instruction for the same amount of time as before - or even more because of more demanding training requirements (discussed below) - the reduced working time has led to a more than proportional cut in apprentices' productive work: fewer total hours, combined with the same time spent on theoretical training, leaves less time for work in production. A hypothetical example will clarify the impact of this change: given a decrease in working time from 38 to 35 hours per week, and

assuming that theoretical instruction at school and work take up 18 hours, the decrease in time for an apprentice's productive contribution is 15%, falling from 20 to 17 hours.

### 3.2. Broader training requirements

The German apprenticeship system is subject to continuous modification. One distinct sign of change is the reduction in the number of occupations from 901 in 1950, to 606 in 1970, to 374 in 1995. The consolidation of older courses is even greater when we consider that new occupations have also been added over time. Since 1969 the skill requirements in all occupations have been modernized and intensified in scope and in depth. In 1995 the Federal Vocational Training Institute was working on updating 90 occupations (Berufsbildungsbericht 1995). In the occupations of the metal and electrical industries, for example, not only an updating but a structural reform has taken place. Since the new standards were set in 1987, apprentices in all the metal occupations undertake a common course for the first one and a half years. Only then does a gradual specialization take place. In contrast to the past, companies must be equipped to train during these years not only for their own specialist occupation, but also in a much broader area. This leads to a reduction in productive time in two ways. First, the more general training takes longer and involves less hands-on production. Second, demands for deeper technical know-how have increased, which require more teaching time for new computer technologies, team work, communication competencies, and complex work processes. Continuing our example from the previous section, the requirement of only one more training hour reduces the time for productive contributions by a further 6% (i.e., bringing productive time down from 17 to 16 hours).

### 3.3. Increased time for vocational schooling

These increased requirements consequently demand a better theoretical preparation and understanding, which leads to longer vocational schooling. Table 4 shows the sizeable decrease in the proportion of trainees in West Germany who attended fewer than 8 lessons per week; the figure fell from 30% to 11% between 1980 to 1990, and it dropped a further 5% in 1994. The effects of this reduction are first, that the increased time spent on theoretical training reduces the time available for practical work and therefore increases the net training costs to the company. Second, any schooling above 8 hours per week generally requires that the trainee attend school for a second day. Since the schooling is occupation-specific and therefore often not available in smaller cities, many trainees have long travel times. The journey time back to the company on that day further reduces the hours devoted to productive work.

A solution to this problem could be the more widespread use of block release,<sup>2</sup> which has in fact been increasing in recent years, or a different organization of the schooling time.

Table 4: Increase in weekly lessons at vocational schools in West Germany \*

	1980	1990	1994
less than 8 lessons	30.8	11.3	5.5
8 to 10	38.1	41.3	30.7
11 and more	14.3	29.8	31.4
block release	17.6	17.6	20.9

\*missing percentages could not be placed in a category

source: *Grund- und Strukturdaten 1995/96*

### 3. 4. Higher training wages

While the above factors indirectly increase training cost by reducing the time available for productive output, the highest cost factor in the variable costs have historically been apprentice wages. The pay differs among occupations, training years, and regions. The highest wages are paid in the public service and in industry and trade: more than 1,140 DM/month on average in 1996 in West Germany. At the low end are craft occupations - such as tailors, who received less than 340 DM per month, and hairdressers, who got 680 DM per month (*Berufsbildungsbericht 1997*). The average remuneration across all occupations was 1055 DM. For the first year the rate is about a third of a skilled worker's wage, and then it increases by about 13-15% each year on average.<sup>3</sup> This relatively low remuneration is seen as representing an investment by the trainee in his or her career.

Between 1991 and 1995 the average wages for skilled employees increased by 16% in the industry and trade sector and by 14% in the craft sector, while the corresponding increase for apprentices was much higher at 20% and 31% respectively (von Bardeleben et al. 1997). Explanations for this increase may be found in a) the general tendency to increase the pay of low earning classes more than the higher ones, and b) the relatively high demand for apprentices between 1990 and 1992, when more than 100,000 apprenticeship places were unfilled each year in West Germany (see below, Table 8). Since wage costs account for 80% of the total net variable costs of apprenticeship training, the increase in net costs is almost the same as the

<sup>2</sup> Block release denotes the system in which, rather than going to school one or two days per week, apprentices spend a period of one to several weeks in school, followed by a period of several weeks at the company.

<sup>3</sup> In East Germany the yearly increases are slightly higher (*Berufsbildungsbericht 1997*).

increase in wages. The variable net costs increased in the industry and trade sector by 20% between 1991 and 1995; however, in the craft sector they have gone up by 400% from the very low level of 1991 (von Bardeleben et al. 1997). The substantial increase in costs has had a significant, detrimental impact on the willingness of companies to train. Employers surveyed claim that a reduction or stagnation of wages and a longer period of time spent in the company (e.g., 40 hour week for apprentices, holidays according to legal minimum, better organization of vocational schooling) will lead to an increased provision of training places. They point to high training costs and short working times as the most important of ten obstacles to increase training (*Berufsbildungsbericht* 1997).

In conclusion, we can see that until 1991 the variable net costs of apprenticeship training were relatively low for all types of companies. Since then, however, considerable cost increases have taken place. Germany experienced a short boom following unification while other countries like the US and UK were restructuring, but since 1992, Germany's economy has lagged far behind its key competitors. Most companies have undertaken serious restructuring efforts, using costs as a dominant variable in decision-making. Increasing training costs therefore has a detrimental effect on the willingness of companies to train. Although the training wages for apprentices are low in relation to German skilled workers' wages, the average wage per apprentice's productive working hour - if we assume 16 hours of productive working time per week and 69 hours per month - is 15.29 DM, which is higher than the wage of skilled workers in many of Germany's competitors. A weekly increase of just two hours in working time would reduce the hourly wage to 13.63 DM. This calculation reflects the sensitivity of training costs to wages.

## 4. The Problems of Unification and the Recession

### 4. 1. Transfer of the Apprenticeship System to East Germany

The transfer of the apprenticeship system to East Germany was in many ways easier than the transfer of other institutions, since a dual system of a certain type had existed in the GDR. In the GDR, about 65% of an age group - a slightly lower figure than in West Germany - entered an apprenticeship after completing general schooling in the 1980s. In contrast to West Germany, the apprenticeships lasted only two instead of three to three and a half years. Apprenticeship was considered basic training, and so many former apprentices later took part in further education courses. As a result of the different industrial structure of the GDR, the proportion of trainees in different sectors was dissimilar between the two systems: 42% of apprentices were in industry and 12% were in agriculture in the GDR, versus 22% and 1% in West Germany. As the craft sector was relatively small, and private companies were limited in

numbers, larger industrial firms were the principal providers of apprenticeship training. The opportunity to take the *Meister* examination played an important role in both systems. In 1989, 17,500 skilled workers passed this exam in the GDR and 55,500 in West Germany, which is roughly a similar proportion of the labor force.

Since unification, an immense further training effort has been undertaken to update the quality of vocational qualifications to the more modern technology of the Western world and to the more demanding aspects of work, e.g., to enable workers to accomplish a broad range of complex tasks without guidance and to retrain those who have lost their jobs in the restructuring process (Andresen 1992, Wagner 1993, Grünert, and Lutz 1995). The institutions that support training in western Germany - such as the chambers, which supervise apprenticeship training (Franz and Soskice 1995, Soskice 1994, Streeck et al. 1987) - had to be built up in the new federal states. Trade unions and employer associations moved to East Germany, and experts from the West German chambers helped to set up the new system and trained the trainers. To compensate for existing deficits in the training facilities, external training centers were instituted in East Germany, at a cost of 450 million DM in 1991. Despite great efforts, the number of apprenticeship places was not sufficient, even in 1991, when the Treuhand kept many companies operating: nine thousand school-leavers had to be trained in external places that year. In 1992-93, the state provided 11 billion DM for retraining and further training. Large investments were made to bring vocational schools up-to-date.

With the transfer of institutions, adjustments to the West German working environment are taking place in the new federal states. Working time in East Germany was 40 hours per week in 1990, but it is moving relatively quickly to the West German standard. In 1996 the 38 hour working week was introduced, while at the same time the vacation period increased from 20 to 30 days. The average wage level of a trainee, like the general wage level, lagged behind depending on the occupation. Apprentices' wages ranged from 39% to 75% of comparable wages in West Germany in 1991. The majority did not reach 65% of the West German level. Thus, the starting wage of a tailor was just 140 DM, of a banking clerk 500 DM, and of a metal worker 420 DM (*Berufsbildungsbericht* 1992). Only two years later, in 1993, wages had reached 80% of the western wage level on average. As the West German wages grew strongly during this period the East German increase is even more dramatic.

#### 4. 2. Supply and demand for apprenticeship places in East and West Germany

The supply of apprenticeship places has historically closely followed demand in recent history in West Germany. An enormous increase in the number of school-leavers at the beginning of the 1980s was absorbed by the dual system (Althoff 1994). Since then the number of school-leavers and apprentices has

been declining (table 5). Keeping this close relationship in mind, the fact that the supply of apprenticeships has been sharply decreasing over the last ten years is in itself no indication of a problem with the dual system. On the contrary, the elastic reaction of supply to demand is a very positive feature of the system. However, the relationship between unfilled demand and supply has changed dramatically since 1990. From 1990 to 1992, more than 110,000 training places could not be filled. At that time every school-leaver who had not found an apprenticeship place statistically had a choice among ten apprenticeship openings; in 1996 there were only 1.4 such openings left. Although this reflects a much more restricted choice, it is still higher than in 1975.

The socialist party has proposed a levy system paid as a proportion of the wage costs to increase the number of apprenticeship openings. It would be implemented when, for each 100 persons looking for an apprenticeship, fewer than 112.5 openings are available, and the average company training ratio (number of apprentices/number of employees) would be less than 6%. The employers' associations argue that this would increase administrative costs and not necessarily lead to more apprenticeship places; as many employers might prefer to pay the levy(as has been the experience with the levy for handicapped employees). In addition, if public officials decide to expand the supply of apprenticeships in areas where there is no demand from employers, this will likely produce a labor market mismatch when apprentices complete their training and look for jobs. For example, in 1995 60% of the male apprentices wanted to train in just five occupations. The openings in these 'dream' occupations, however, offered enough places for less than half of them. Sixty percent of the female apprentices also wanted to enter just five occupations; little more than half of them succeeded (*Berufsbildungsbericht* 1997). Although not all apprentices can follow their wishes, the big advantage of a voluntary provision of apprenticeships by employers is that it closely follows the demand by the economy.

Table 5: Supply and Demand for New Apprenticeships (in thousands)

year	West Germany				East Germany			
	supply of Training Places	demand	unfilled supply*	unfilled demand*	supply of Training Places	demand	unfilled supply	unfilled demand
1975	480	486	18	24				
1980	695	667	45	17				
1990	659	559	114	14				
1992	623	512	123	12	99	96	3	1
1994	503	468	53	18	119	119	1	2
1996	483	473	34	25	126	139	1	13

source: *Grund- und Strukturdaten 1996/97, Berufsbildungsbericht 1997*

\*unfilled supply: open apprenticeship places; unfilled demand: school-leavers still looking for an apprenticeship place.

Table 6a shows the numerical development of apprenticeship places in different sectors in West Germany. The service sector exhibits steady growth, reflecting the increase in the services' share of the economy. The industry/trade and the craft sectors vary greatly, showing much flexibility in reaction to changing demand. Some authors have criticized the strong increase in craft apprenticeships from 1970 to 1980, when the school-leavers from the baby boom entered the labor market (Casey 1990, van Lieshout 1996). They argue that mainly the "cheaper" - i.e., the craft apprenticeships - were opened up, and that the industry/trade sector did not react. However, the interpretation depends very much on the base year that is chosen. If we consider the increase from 1975 to 1985, then the industry and trade sector exactly matches the 38% increase in the total number of apprentices, while the increase in the craft sector was slightly lower with 36%. Thus, the burden of the increase from 1975 to 1985 was almost equally split between these two sectors. A similar development can be seen in the decrease from 1985 to 1994, where both sectors took 33% fewer apprentices.

Table 6a: Apprenticeships in Different Industry Sectors and New Contracts in West Germany since 1970 (in thousands)

year	total	industry/ trade	craft	liberal occ. *	new contracts
1970	1269	725	420	56	
1975	1329	634	505	103	462
1980	1716	787	702	114	650
1985	1831	875	688	131	697
1990	1477	756	487	130	546
1995	1250	561	470	143	450

*Grund- und Strukturdaten*, different years

\*doctors, dentists, accountants, lawyers, etc.

In East Germany the supply of apprenticeship places has been increasing since 1991, but not as quickly as demand (Table 6b). Demand increased between 1992 and 1996 by 45%, but the supply of places increased by only a quarter. It has created a situation with a higher demand from young people for training than supply, a case which occurred in West Germany only in the middle of the 1970s (table 5). This has led to the creation of considerable government programs offering apprenticeship places, which have not been taken into account in these figures. While at the beginning these programs were mainly undertaken in fictitious companies, in 1996 the majority of apprenticeships were done in close cooperation with real companies.

Table 6b: Apprenticeships in Different Industry Sectors and New Contracts in East Germany since 1991 (in thousands)

year	total	industry/ trade	craft	liberal occ.	new contracts
1991	235	145	67	6	
1993	287	140	109	15	99
1995	329	142	146	17	123

source: *Grund- und Strukturdaten*, 1996/97

A comparison of the different sectors in East Germany shows that only in the industry/trade sector has a slight decrease in apprenticeships taken place. Unlike in West Germany, where the increase in different sectors over time has been stable, the underdevelopment of certain sectors of the economy in the GDR accounts for the over-proportional expansion in apprenticeship places in these sectors. The craft sector and the service professions have increased

more than twofold, reflecting their increased business activities, but the growth in the demand for apprenticeship places was higher still. According to an employer survey, more training might be possible in the future: about 1500 East German companies that currently do not train could be mobilized to offer additional apprenticeships if they could get help to organize cooperative training and be supported by external training centers (*Berufsbildungsbericht* 1996). Two thirds of these places would be in the craft sector, 20% in services, 10% in the liberal professions, and only 2% in industry. In addition, companies that already train would do more if additional financial support were available and cooperative training partners could be found. To overcome these difficulties, the chambers have attempted to publicize cooperative training and funding.

The difficult situation in the apprenticeship system has also led to an increase in the drop-out rate. In 1995, 25% of the new contracts in West Germany and 21% in East Germany were dissolved, compared to just 16% in 1986 in West Germany. The more restricted choice of apprenticeship places might be one reason, as about 60% of the drop-outs happens in the first training year (mostly during or before the probation period). Half of these dropouts find a new training place. Another reason is the harsh economic climate - about 8% of trainees in West Germany and 27% in the East had formally to enter a new contract because of a change in the ownership of their company (*Berufsbildungsbericht* 1997).

#### 4. 3. Increase in Unemployment

After a strong boost to the West German economy from unification in 1990-91, recession hit Germany harder than in other industrialized countries. Employment in manufacturing declined by more than 10% between 1991 and 1994, whereas the total decrease in the previous decade had amounted to less than 3%. Total unemployment rose during this time from 7% to 9%. This figure would be even greater if many firms had not tried to hold on to their employees through the introduction of shorter hours), in the hope that the economy would pick up again after a short while. Table 7a shows this rapid increase in the number of short-term workers.

Table 7a: Employment in West Germany according to sectors, unemployment rate and short term workers in mechanical engineering since 1991

year	manufacturing	trade/traffic*	agriculture	short-term workers**	unemployment %
1991	11,095,000	5,628,000	957,000	4,307	7.2
1992	10,897,000	5,713,000	909,000	5,593	6.3
1993	10,376,000	5,665,000	856,000	16,340	6.6
1994	9,969,000	5,587,000	815,000	180,232	8.2
1995					9.3

\* and communication

\*\* in mechanical engineering

Source: Statistisches Bundesamt 1996

The contraction in East German manufacturing employment was far more extreme, declining by 25% in just three years. Short-term work was used extensively to maintain working places after unification but then decreased when it became clear that these places could not be kept (table 7b). In consequence, products and production were restructured and hidden unemployment removed. As there was no demand for many products in the free market, and those firms with viable products were often very inefficient, the transition from a planned economy was difficult, and many companies went bankrupt. Eastern German firms lacked managerial and technical qualifications, sufficient equity capital, and the collateral necessary to secure bank loans (as the ownership of buildings and sites were not clear for a long time). The ensuing crisis would have been much more severe if managerial help and investments had not been transferred from West Germany (Wagner 1993, Hitchens, Wagner, and Birnie 1991).

Table 7b: Employment in East Germany by sector, showing short term workers and unemployment rate since 1991

year	manufacturing	trade, traffic*	agriculture	short-term workers**	unemployment rate (%)
1991	3,112,000	1,320,000	454,000	-	-
1992	2,450,000	1,244,000	282,000	165,648	12.2
1993	2,322,000	1,219,000	232,000	64,075	14.3
1994	2,342,000	1,213,000	226,000	31,294	13.7
1995					14.9

\* and communication

\*\* in mechanical engineering

source: *Statistisches Jahrbuch* 1996

The job losses in East Germany mainly affected workers in industry and agriculture, where employment has dropped by about two thirds since 1989. It will be very difficult to turn this development around, since many companies are barely surviving, even with wages that remain substantially below those in West Germany (Mallok 1996). The only increase in employment can be found in the so-called 'liberal professions,' many of which were almost nonexistent in the GDR. These include lawyers, tax advisors, and insurance agents. Even the trade, traffic, and communications sectors have lost working places. Unemployment rose to almost 15% by 1996, which does not include the high number of people in early retirement, further training measures, and work creation programs (*Arbeitsbeschaffungsmassnahmen*). If we add to the unemployed those in work programs or further education, along with those who are not registered as unemployed because they have become so discouraged that they are not seeking work, the figure reaches 28%. Adding those who commute to West Germany for jobs and who are currently in early retirement we can estimate that working places for about a third of the labor force are missing in East Germany. This does not even take into account those who went into early retirement before 1996 (table 8).

Table 8: Unemployment and people not in 'regular' employment in 1996

Labor Force	7,559,525	100%
unemployed People	1,097,572	14.5%
people in work programs	287,316	3.8%
people in further education	490,583	6.5%
people not registered as unemployed*	265,000	3.5%
sum		28.3%
commuters from East to West	323,329	4.3%
early retirement**	160,000	2.1%
total		34.7%

\* *Stille Reserve*:

\*\*at the beginning of 1993 almost 900,000 people went into early retirement.

Source: Bach et al. 1996

#### 4. 4. Reduction in training

The economic recession has had a big impact on the training system in both parts of Germany. First, the reduced employment means that fewer companies remain to offer apprenticeship places. Second, the continuing pressure to reduce the workforce makes it hard for the surviving companies to justify the intake of apprentices. Apprentices do productive work that the present workforce would like to keep for itself to secure its own employment, particularly if many of them have to accept reduced hours; and the trainees might not be retained after completion of their apprenticeships, and the related benefits for

the firms could not then be included in the cost calculus. Third, at a time when firms are focusing on cost-cutting, the recent increases in training costs might lead companies to defer offering apprenticeship places. The impact might be particularly serious in the *Mittelstand* companies, which do no detailed cost/benefit calculations, but which are acutely sensitive to wage increases. Fourth, the large number of skilled people out of work reduces the hiring costs (see chapter by Culpepper).

In East Germany the situation is more severe, and each of the above arguments has a correspondingly greater impact. In addition to the above mentioned effects on training, the apprentices in East Germany are competing to a much larger extent with adults in further education programs, whose wages are largely paid by the government for their first period of employment. Further, not only is the relative supply of apprenticeship places lower than in West Germany, but in contrast to the trend in West Germany, the demand for apprenticeship places from school-leavers is growing.

The adjustment of company training activities to the economic downturn differs by firm size and by industry. Overall, the apprenticeship training ratio in West Germany decreased from 7% in 1990 to 5.5% in 1995. Small plants have been and remain the most active in training (Table 9), since they can keep net variable training costs relatively low (see section 2). Establishments with more than 500 employees have the lowest training ratio, as these companies have the highest training costs. However, the effects of increased costs and the recession are also felt in the small companies, which have reduced their average training ratio by more than 20%. Between 1994 and 1995 there was a slight increase in the number of training companies (Table 9), which is almost exclusively due to the small establishments. For companies taking on an apprentice for the first time, there is a subsidy of 5,000 DM per apprentice. For smaller companies the subsidy may significantly offset net costs and allow them to break even.

Table 9: Apprentice training ratio (apprentices to employees) according to plant size in West Germany in 1990 and 1995

no. of employees	apprentice training ratio		# of training companies	
	1990	1995	1994	1995
1-9	10.9	8.0	217,055	220,354
10-49	8.3	6.6	119,883	120,621
50-499	5.9	4.5	42,779	42,658
500 +	5.2	4.3	4,304	4,241
total	7.0	5.5	384,021	387,874

source: data provided by the BMBF (1997) based on the employment statistics of the Bundesanstalt für Arbeit and calculations by the Bundesinstitut für Berufsbildung.

Between 1990 and 1995 the proportion of enterprises providing apprenticeships dropped from 28% to 24% (Table 10). Traditionally the metal-

working, precision engineering, and leather, textile, and food industries have been most engaged in training. The strongest decline in percentage terms has taken place in the leather, textile, and food industries, where many plants have closed or transferred production to lower wage countries.

Table 10: Percentage of plants with apprentice training according to industry in West Germany

industry	plants training as a proportion of all plants	
	1990	1995
metal working	42.4	33.6
precision engineering, optics, watches	39.0	34.7
leather, textile, food	45.1	32.6
trade	22.9	16.9
traffic, communication	11.6	10.3
banks, insurance	22.2	18.8
services	27.6	24.1
total	28.3	23.7

source: BMBF (1997) based on the Beschäftigtenstatistik der Bundesanstalt für Arbeit and calculations by the Bundesinstitut für Berufsbildung.

## 5. Measures to Ease the Strain on the Apprenticeship System

In the last few years, the pressures on the apprenticeship market have shifted from the demand-side (not enough young people seeking to fill apprentice openings between 1990 and 1992) to the supply-side (not enough apprenticeship places since 1993). In earlier years, concerns were raised that the apprenticeship system might not be attractive enough to entice a sufficient number of adequately qualified school-leavers in the future. With the rising costs of training and the recession, this situation has changed dramatically. The present high demand for apprenticeships by school-leavers indicates a greater need to think about measures to keep the apprenticeship system attractive to companies. Policy-makers must deal with the problems of both supply and demand.

## 5. 1. Increasing attractiveness of the dual system to companies

### 5. 1. 1. Designing apprenticeship occupations for new markets and updating existing qualifications

The globalization of markets, the restructuring of employment in manufacturing, and the increased importance of the service sector have a variety of impacts on apprenticeship profiles. The introduction of new technologies and work organizations require integrated job structures for which job profiles have to be adjusted or almost completely changed. For example, in the metal-working industries the new requirements include, in addition to deeper technical know-how, the individual planning of work, interpersonal skills, diagnostic skills and the correct response to problems and defects, planning of materials and tools, quality assurance, responsibility for delivery on time, and cost management (Geer 1994). At the same time the restructuring across and within economic sectors leads to a) a change in the demand for different occupations in each sector - the economic restructuring in East Germany shows this strongly - and b) the need to develop apprenticeships in innovative business areas. While the restructuring among individual sectors is quantitatively managed by the increase and decrease in the supply of apprenticeships by the companies, the development of training profiles for new business segments has to be realized by the cooperation of the social partners together with the government. One such area is multimedia, where microelectronics has changed the industry and a considerable growth in employment is expected through at least the year 2010. This demand was recognized by the employer association and the trade union, and together with the Federal Institute of Vocational Training, five new apprenticeship occupations with integrated job profiles were created for the media market. In 1997, 5,000 apprentices have already registered in these new professions. Similar trends are observable in the fields of information technology, safety, leasing, environment, and fast food, where additional openings of apprenticeship places could be achieved once the job profiles are defined. Since the German system is based on cooperation and consent by employers, trade unions, and the government, the development of new job profiles can be slowed when the different interests cannot agree on a common set of skill requirements. The required consent also makes it difficult to update profiles quickly: for the metal occupations, this process took more than ten years. However, the pace of revision has recently quickened. In 1996, 26 new occupations were issued and 50 others modernized.

### 5.1.2. Cooperation among companies

Due to the increased breadth of training and the requirement for quality in updated apprenticeships, not all companies can fulfill modernized training requirements in the prescribed range. Therefore, cooperation among companies has developed to complement each other's capabilities. In some

cases, larger companies with a wide range of activities and a modern training workshop offer training courses to other companies for which they pay a fee. The effect is twofold: the large company can increase the utilization of its training facilities and lower its unit costs, and at the same time the smaller companies can offer apprenticeship places despite their more limited range of work processes.

Another way of cooperating is when two companies that have differing operations split the training of a single apprentice. An apprentice spends a certain time at one company for one area of training and then continues at another company to learn a different skill set. A familiar example is the *Hotel-fachmann* (skilled hotel clerk), who has to be trained in the kitchen/restaurant as well as in the reception/rooms area at a hotel. Since many firms specialize in either restaurants or accommodation, they divide the labor of the training phases according to their specialties. In an effort to convince more companies to offer apprenticeship places, the government and the chambers have increased support for companies to find a training partner during the past few years.

### 5.1.3. Training centers

Cooperative training arrangements are not easy to set up, particularly for the large number of smaller companies, because the different elements of training requirements have to be met. Very often only a few elements are missing, making it more worthwhile to offer a few matching courses rather than to look for a company with which to enter a cooperative arrangement. To enable these companies to train, the state has supported the establishment of external training centers, where specific courses are offered to fill the gaps in a company's training capacity. The chambers, trade unions, and employers' associations manage most of these centers, supplying training modules that the companies cannot themselves provide. In 1991, 77,000 of these training places existed in West Germany. In East Germany they were built up quickly after unification to help stabilize the shaky training market: the number of East German apprentices in training centers increased from 25,000 to 32,000 between 1991 and 1994.

## 5.2. Attractiveness of apprenticeship for school-leavers

### 5.2.1. The apprenticeship exam - a milestone for semi-skilled workers

The apprenticeship examination is accepted as an important career step in Germany, and it carries with it a high reputation. Therefore it is important that

persons who are disabled or disadvantaged, or who have failed to enter apprenticeship training directly after general school, have a chance to achieve this level. A number of measures exist to help disadvantaged individuals become qualified, such as a vocational preparation (or foundation) year to boost basic skills prior to entering an apprenticeship along with subsequent tutoring during the apprenticeship (see above). For those who have not previously entered apprenticeships, opportunities exist to take the examination at a later stage without attending vocational schooling. To qualify to sit the exam, semi-skilled workers must show evidence that they have experience for at least twice as long as the training period lasts in the corresponding apprenticeship training. The number of people taking advantage of this opportunity has been increasing over the last ten years: in the industry and trade occupations the number of people taking the exams externally increased from 19,000 in 1984 to 28,000 in 1994, which amounts to 8% of the exam participants (*Berufsbildungsbericht* 1997). This increase reflects, on the one hand, the permeability of the system; on the other hand, the demand for this examination by outsiders shows its attractiveness as a milestone for lifelong learning activities, particularly for an aging labor force (see chapter by Gatter).

### 5.2.2. From skilled worker to manager

The traditional career ladder for skilled craft workers is to take and pass a *Meister* or technician examination after at least two years of experience. The further training for *Meisters* is usually done in evening classes, while for technicians it is done in full-time courses (Prais and Wagner 1988). Most of the training comes at the expense of the participant, although in some cases subsidies and grants from the state are available (e.g., the *Meister-Bafög*). The number of occupations having the possibility of taking a *Meister* examination has grown; since the 1970s, when the *Meister* exams were only common in the craft area, *Meister* exams have been developed for different industrial areas. A wide variety of other further education examinations exist in other sectors (Finegold *et al.* 1996). This career ladder is an important incentive for better qualified young people to enter the dual system, as they can move into supervisory or middle management positions without the need to complete the demanding top educational track and without studying at university. In 1993 45,000 skilled workers passed the *Meister* exams in the craft sector, 15,000 in the manufacturing sector, and another 45,000 corresponding levels in the clerical area. These 105,000 further training certifications can be compared to the 530,000 apprenticeship exams passed in the same year, which suggests that about 20% of apprentices take this career step. As is the case for the apprenticeship examinations, the need for modernization of the further education profiles has become clear. Recently, negotiations to give the chambers more flexibility in the creation of new or the modernization of existing further training regulations were completed successfully (CEDEFOP 1997).

Drexel (1995) has expressed skepticism as to whether the *Meister* position will still be viable after the introduction of modern work processes, in which

front-line workers take over many of the traditional responsibilities of the *Meister*. However, research based on in-firm studies has shown that an increasing demand exists for more highly skilled individuals to perform a variety of tasks, from quality control to group facilitator, for which people with *Meister* qualifications are sought (Finegold and Wagner in this volume, Mason 1997). The curriculum for the *Meister* examination is adapted to new requirements so that the progression route remains open and even more attractive.

It should be noted that passing the *Meister* exam is not identical with having a *Meister* (supervisor) position. Despite the high number of *Meister* exams passed, only about one-third of the industrial *Meister* positions are occupied by a person with a *Meister* examination. Although a pass in a *Meister* exam does not automatically qualify for promotion to a *Meister* position, only one in seven of those who pass has a position below his/her qualification (Steedman et al. 1991, Hecker et al. 1997). *Meisters* might have moved to a technical position of comparable status to manager without having people reporting to them or opened their own business, which is encouraged by German law - it allows only people with a *Meister* certificate to manage a craft business. A survey of newly qualified technicians and *Meisters* conducted by the Federal Institute of Vocational Training has shown that skilled workers take *Meister* or technician training courses in order to achieve a higher or better position, to differentiate themselves from other skilled workers, and to reduce the possibility of being laid off (Hecker 1997). Only a few *Meisters* expect that persons coming from the higher education route, such as graduate engineers, would be competitors for their positions.

### 5.2.3. Equivalence of general and vocational training

Anxiety has been expressed that the most able school-leavers increasingly go to university and that not enough people with a good school qualification remain in the dual system. Although a career structure exists for apprentices to the *Meister* and the technician exams, there is no direct formal path of career advancement beyond this point. Entering university currently requires individuals to pass courses in general education, but a new law is now being implemented to allow for more flexibility between general and vocational schooling. In the future, people with the *Meister* or technician certificates may enter university without any additional testing. This change will potentially attract those school-leavers who are undecided about their occupational choice and who choose the Gymnasium track just to keep open the possibility of a university education. With the new regulations, they might enter an apprenticeship to learn the practical aspects of an occupation first, and if they do well, they can continue at an institute of higher education. Given a continuous increase in the qualification level of apprentices over the long-term (with 15% of the apprentices now already having passed the university entrance exam), the concerns expressed above might be overly alarmist. Moreover, statistical analysis shows that the vast majority of the changes in demand for apprenticeships observed between 1980 and 1996 were due to demographic changes, reduced supply of apprenticeships, and structural

changes in the economy; these variables explain 97% of the variation, leaving only 3% unexplained (Behringer and Ulrich 1997).

However, in comparative terms the German system still lacks flexibility between work and education for the adult work force. In the U.S., for example, it is quite common that people leave work and go back to college, full or part time, which is still rare in Germany. Given the growth in knowledge work, which requires lifelong learning on and off the job, a greater flexibility of the schooling, university, and dual system is a precondition for remaining competitive in a changing world.

### 5.3. Creating more training places

Shortly after unification the German government promised that each school-leaver in East Germany would get an apprenticeship. To fulfill this promise, a program was begun that gave small enterprises 5,000 DM for each additional apprentice they hired (see above paragraph 4.4.). Companies that took trainees laid off by bankrupt companies received a larger sum, 8,000 DM for each apprentice. However, the decreasing employment in East Germany made it difficult to meet the increased demand for apprenticeship places with even these generous subsidies. Although by 1994 15,000 East German apprentices were trained in West German companies, the number of training places was still not equal to the demand for apprenticeships. In 1994, 35,000 apprentices were full-time trained in training centers financed by the government, of which 14,000 were new places to accommodate every school-leaver from that year who had not found a place in a firm. Similar numbers were taken in 1995 and 1996. To maintain a strong incentive for school-leavers to search for in-company training places, the wages in external training places - which are funded under §40c *Arbeitsförderungsgesetz* (work promotion act) - were restricted to 460 DM in the first, 483 DM in the second, and 507 DM in the third training year in 1996 (BIBB 1997).

To motivate more companies to offer training places, more than 9,000 career advisers from the labor offices and the chambers have been sent to companies to campaign for new apprenticeship places and training cooperation. They visited more than 110,000 companies throughout Germany and were able to persuade firms to create 27,000 new training places. A program of 54 million DM was set up to support this kind of activity and to finance up to 150 training place "developers" for the period between 1995 and 1998.

### 5.4. Reducing costs

As discussed previously, the costs of training and the reduced hours of apprentices at their companies have been pointed to by employers as major

obstacles to increasing the supply of apprenticeships. The greater time spent in the classroom limits the apprentices from doing productive work, and hence is a major driver in the increase in the net training costs of employers, to which several policy responses have been developed. First, the federal ministry has proposed increasing the working time of apprentices at companies by reducing schooling to only one day in the second and third years of apprenticeship, hoping thereby to increase the willingness of companies to take on apprentices. Two states - because the authority in educational matters lies with the states (Länder) in Germany - have taken this proposition on board, and have increased the number of school lessons per day from eight to nine. This restructuring of schooling leads to an increase in the presence of apprentices at the company by twenty to thirty working days per year, which is quite large if it is seen in relation to the productive time of the trainees (iwd 1997).

A second response to the problem of high costs has been a wage increase of only 1.8% in 1996. While this is a first step, any further increases in apprentice wages must be watched carefully. For many companies, wages are the most obvious and usually the largest cost item. A decrease in the remuneration of apprentices in relation to skilled workers might increase the willingness of companies to offer more training places. The social partners should therefore try to keep the rises in wages for apprentices lower than the rises for the skilled workers. Third, the chambers have also contributed to a decrease in training costs by waiving or reducing their collection of examination fees for additional training places (*Berufsbildungsbericht* 1997). For the other training places, the chambers have agreed not to raise the fees for the next few years, although the fees cover just 50% of the costs incurred by the chambers. Fourth, the training in large companies could be more work-oriented; apprentices prefer to do 'real' work instead of producing training pieces which are then thrown away. The earlier involvement of apprentices in production has decreased the gross training costs by ten to fifteen percent at companies like Volkswagen. They could also be involved in developing solutions for particular problems on the shop-floor, using team approaches. Companies that have tried this technique cited as examples the improvement of the lighting on the shop-floor or designing and producing new logo signs. The benefits from these 'exercises' more than match the training costs.

## 6. Conclusions

In the last few years the pressures on the German apprenticeship system have grown. Because of the high interdependence of social and economic factors it is difficult to identify a single cause. From the above analysis we have seen that, until 1991, the costs of training were finely balanced with the benefits accruing to the training firm during or shortly after apprenticeship. Up to that point, the supply of apprenticeship places consistently exceeded the number of school-leavers seeking apprenticeships. Since 1990, however, the wages of apprentices have risen more rapidly than those of skilled workers. Simultaneously, higher training requirements and shorter working times have

reduced the time apprentices devote to productive work. In response to the increases in cost, the supply of apprenticeship places decreased much more quickly than the demand for places.

Some small steps have already been undertaken to remedy the high costs of training which, if continued, might bring the system slowly back into equilibrium. For a faster adjustment more rigorous measures would have to be tackled. Splitting one wage between two apprentices has been suggested as a proposal to reduce costs and to entice more employers to offer apprenticeships. This suggestion - which implies halving the wage of apprentices - is probably too radical to be politically palatable. However, a reduction of fringe benefits to the legal minimum and a reorganization of schooling to become more effective might decrease net costs considerably. If this balance cannot be achieved, the poaching problem, which is familiar from the Anglo-Saxon context, might come up in Germany as well, hindering early investments in human capital.

In East Germany the economic situation is much more severe: the loss in working places there has been more drastic, the real unemployment rate is extremely high, and the threat of future unemployment increases is very real, as productivity is still very low and wage increases continue to outstrip productivity gains. Therefore it will be even more important to keep the wages of apprentices relatively low so that companies can break even on training and thus remain motivated to offer apprenticeship places. Even then, a long period of dynamic and persistent growth will be required before the East German economy is healthy enough to offer a sufficient number of training places; a continuing need for state support can be expected in order to place all apprentices over the next few years. In West Germany, an upswing of the economy and a reduction in the costs of training by various methods might result in a situation like that at the beginning of the 1990s, characterized by a high supply of apprenticeship places and a low demand because of the depressed West German birth rates. In this situation an internal migration of East German school-leavers to enter West German apprenticeships should be encouraged.

To ensure sufficient demand for apprenticeship places in the future, it is important that the training system remains attractive to school-leavers. It has to provide up-to-date skills that will lead to good jobs with a promising career. The modernization of apprenticeships should closely follow leading technologies and the development of new industries. The contact between schools and companies should also be improved to facilitate an efficient training program. The equalization of general and vocational training certificates will widen career choices and attract more able school-leavers. Additionally, it will improve the flexibility of the educational system and remove a disadvantage in further education of the German system, which otherwise would hinder the lifelong learning requirements of an aging workforce.

The restructuring of German companies in response to globalization - a process sped up by the recession - has forced them to become leaner in their work organization, with fewer hierarchical levels but with higher demands on

technical and communications skills placed on each employee along with the ability to do team work. The consequently higher complexity of work will lead to a demand for better skilled personnel. Broadly based apprenticeships seem to be capable of providing this functional flexibility and are a good basis for lifelong learning and relearning, such that the dual system remains an important asset for the German economy. The biggest danger to the sustainability of apprenticeship, however, may lie in current and future company investment strategies, with many companies concentrating future growth in production facilities outside of Germany because of concerns about cost competitiveness. Therefore, employment growth in new markets has to be promoted, for which new occupation profiles have to be created rapidly.

Considering all these factors the German dual system is not in crisis, but it must react flexibly to changing market conditions. Over the past decades the system has proven that it is able to adapt. However, the strong recession in West Germany combined with the collapse of the East German industrial working places put a higher level of strain on the apprenticeship system than it has experienced previously. The favorable economic situation at the beginning of the 1990s and the scarcity of demand for apprenticeship places have also led to cost increases that the system cannot bear, and which need to be reduced quickly. All social partners have to strengthen their efforts to overcome these difficulties and to adjust the system. Most of the problems have been acknowledged by the government in accepting the report on "the reform project for vocational training - for more flexible structures and modern occupations" in April 1997 (Schmidt 1997). However, these insights have to be converted into actions.

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