YOUNG AND OUT IN GERMANY: ON THE YOUTHS' CHANCES OF LABOR MARKET ENTRANCE IN GERMANY

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ABSTRACT

This paper deals with the labor market entrance of young people in the Federal Republic of

Germany. The main focus is on failures during this stage. First, an overview of the youth labor

market in Germany is given. Then, the transition from vocational training to work is analyzed: The

duration of the first spell of non-employment after completion of formal vocational training is

analyzed by means of a proportional hazard function approach. Besides the strong influence of the

human capital variables there is a striking effect of the family background of the youths. The

following section addresses the extent to which early failures in the work history have long-lasting

effects on future incomes. There is some evidence for a permanent income reduction.

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Contents

1 Introduction

The youth labor market in Germany quite often holds fascination for labor economists and policy makers: compared with other OECD countries youth unemployment rates in Germany are considerably below average and are beaten only by Japan, Luxembourg, and Switzerland. Moreover, the German apprenticeship training system is frequently referred to as a promising model for vocational education.

Whatever the merits of the institutional regulations and the functioning of the German youth labor market are, this paper focuses on those youths who fail in this system at one point or another. Hence, our study deliberately refrains from joining the literature analyzing the advantages of the dual system in Germany (without denying that there are a lot of them). Rather, our concern is the group of young people who either do not find an apprenticeship training or do not successfully complete such a training for whatever reasons, or fail to get a job after apprenticeship training. More specifically, the paper is devoted to a treatment of the following type of questions: How does youth unemployment evolve in comparison to adult joblessness? Are there any differences in the risk and/or the duration of unemployment? To what extent does the apprenticeship training system relegate unemployment to higher age groups? Who does not get an apprenticeship and what happens to him? Which individual characteristics of the youth make him or her most likely to fail at one stage or the other in early work history? To what extent can a disadvantageous family background be blamed for failures? Do early failures constitute permanent scars or temporary blemishes?

Since our approach is empirically oriented – including a microeconometric analysis of some of the aforementioned aspects – a serious caveat is in order. Focusing on youths and, moreover, concentrating on problem groups of young people, means a substantial reduction in sample size even if the entire data set is large. Therefore, some of our findings represent case studies, the robustness of which is under question.

The paper is organized as follows. Section 2 not only offers an overview of the youth labor market including its dynamics and institutional framework, but also provides a quantitative assessment of those youths who fail during several transition stages from school to work. Section 3 analyzes the duration of the first spell of non–employment after completion of formal vocational training. The estimates are based on a proportional hazard function approach for grouped durations. Section 4 addresses the question as to what extent early failures in the work history have long–lasting effects on future incomes. Section 5 summarizes our findings.

2 Problem Groups in the Youth Labor Market in Germany: An Overview

2.1 Youth Unemployment: Getting the Questions Right

As an obvious starting point figures 1 and 2 display time series of youth and adult unemployment rates for West Germany distinguishing between males and females

and several age groups. The definition of unemployment rates follows official statistics in Germany, i.e. registered unemployed persons divided by members of the labor force (including self–employed persons). Note, however, that youths looking exclusively for an apprenticeship training are not counted in official unemployment statistics because they are "not at the disposal of the labor office" (see below).

Both figures reveal that youth unemployment in Germany is, to some extent, relegated to the age group 20 to 24 years. Male unemployment rates for youth aged 20 to 24 years exceed those of youths aged less than 20 years by 2.2 percentage points on average during the time period 1983 to 1993, with a maximum of more than three percentage points in the recession year 1993. These differences with respect to age groups are less marked for females. Hence, the question arises as to why youth unemployment rates differ so much between age and sex groups.[1] In section 2 we therefore investigate the extent of possible failures during the transition phase from school to work using aggregate data, while section 3 is devoted to a microeconometric analysis concerning failures to enter a first job.

A second striking feature emerges if we compare youth and adult unemployment rates. Between 1980 and 1987 all youth unemployment rates displayed in figures 1 and 2 exceed adult unemployment rates, partly by a considerable amount. With males aged 20 to 24 years as an exception, all but one youth unemployment rates fall short of adult unemployment rates afterwards.

We have noted already that official unemployment figures do not include youths looking exclusively for an apprenticeship training. Information on those is available for September each year and refers to youths registered at the labor office and looking for an apprenticeship training. They are far from being a negligible number. For example, in West Germany during the recession year 1993 about 67,500 youths aged less than 20 years were officially registerd as being unemployed (East Germany: 22,600). In September of the same year 14,800 youths were not yet recruited for an apprenticeship training position in West Germany (East Germany: 2,900). When a boom year such as 1991 is considered the respective figures for West Germany are 54,200 unemployed youths and 11,200 applicants, i.e. official youth unemployment figures for West Germany have to be multiplied by a factor around 1.2 for a broader definition of youth joblessness. It should be stressed, however, that these calculations represent a crude approximation at best. Many of those applicants receive an apprenticeship training position rather quickly after September because a considerable number of these positions are blocked for some time by multiple applications (it is not required that the labor office be involved, neither by applicants nor by firms offering apprenticeship training). Moreover, an unsuccessful search for an apprenticeship training does not necessarily mean unemployment but may end up in further school education, for example. Under these caveats figure 3 nevertheless gives an impression of the magnitude of problem groups among the young on the labor market. The figure converts official unemployment rates for youths less than 20 years into youth joblessness rates by including yet unsuccessful applicants for an apprenticeship training.

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[1]See Franz (1982) for an earlier study.

Figure 1: Youth and Adult Unemployment Rates: Males
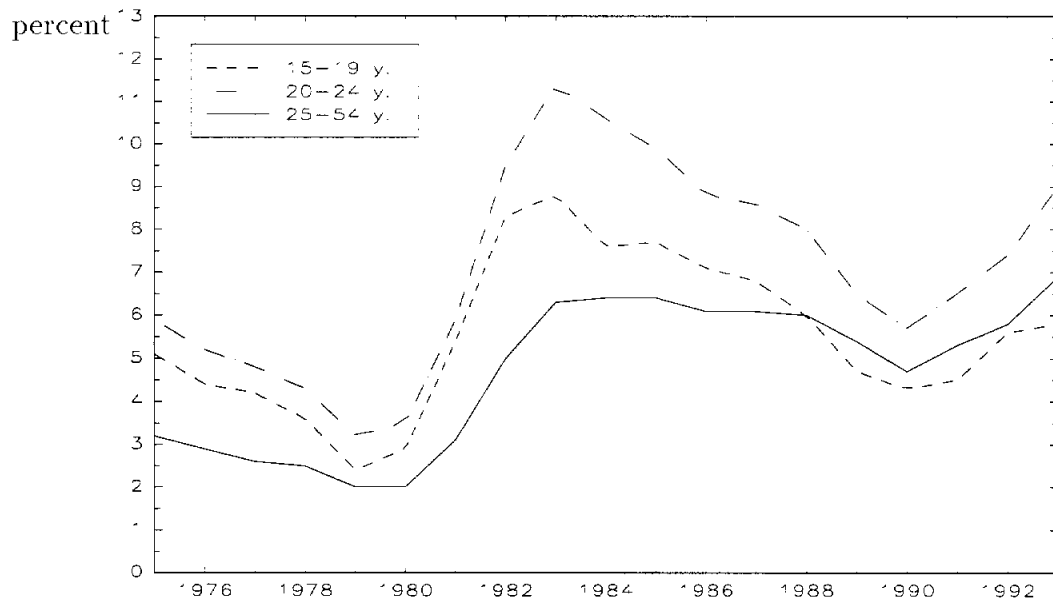
Figure 2: Youth and Adult Unemployment Rates: Females
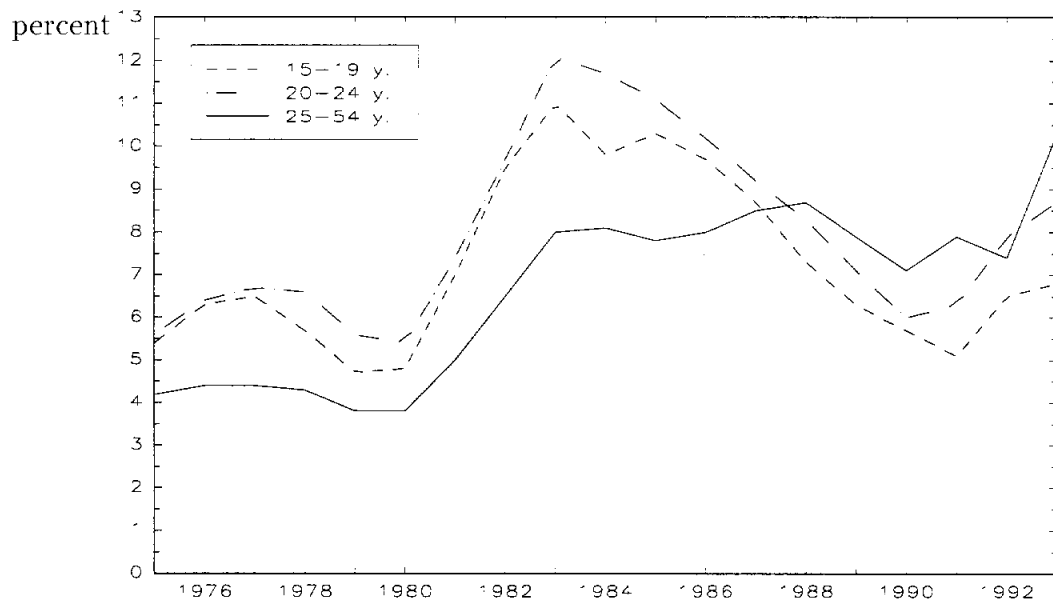
Source: OECD Labour Force Statistics. 1973-1993. pp. 480/481.

Figure 3: Official and Corrected Youth Unemployment Rate[a])
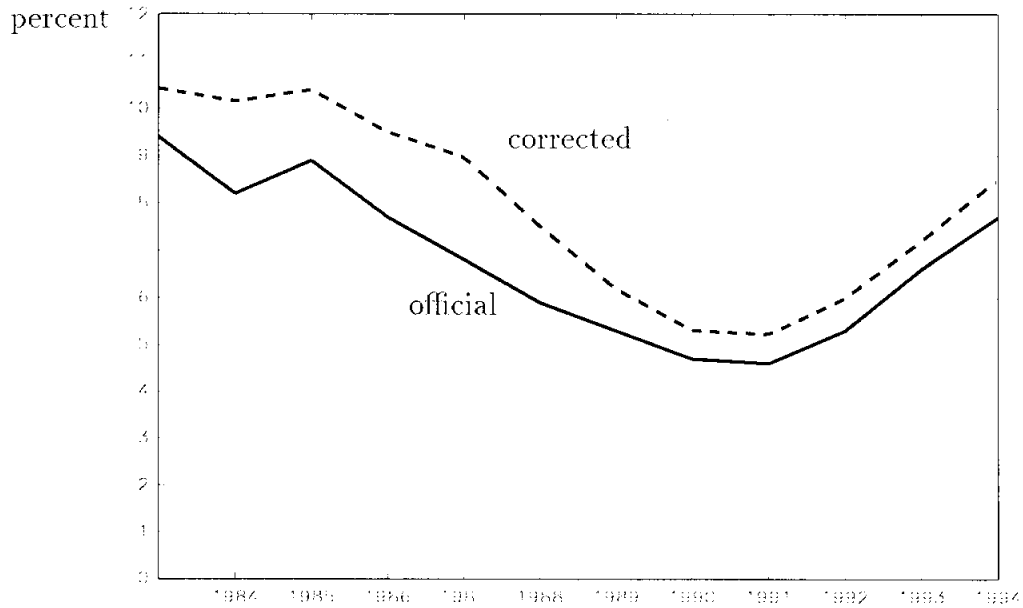
As is well known, unemployment rates are of limited importance because they are silent on the dynamics of unemployment, such as the risk and duration of unemployment or the occurrence of multiple spells. To begin with, table 1 shows annual figures averaged over a five year period on risk and on duration by age and sex. The risk of becoming unemployed is measured by the annual sum of inflows into the unemployment pool divided by members of the labor force of the respective group. Thus, "risk" also includes multiple entries into unemployment by the same individual (per year). "Duration" means completed unemployment duration of those individuals who left the unemployment register during one year. where the annual data of each individual are taken within the time period between October 1st, previous year and September 30, current year. In light of these definitions, dictated by the data set, it is obvious that the figures in table 1 suffer from various deficiencies. They do not allow a distinction between unique and multiple spells of unemployment per individual and, moreover, long–term unemployed may be underrepresented in the calculation of unemployment duration. Under these caveats they support an observation made in many, if not in most countries, namely that youths suffer from a higher risk of becoming unemployed compared to elder members of the labor force, such as those aged 55 to 59 years. but that they face a considerably shorter duration of each unemployment spell (not necessarily of unemployment as far as they experience multiple spells of unemployment). Both, risk and duration are higher for male youths aged 20 to 24 years compared with the younger age group. For female youths, however, only duration increases with age and the reverse is true for risk. Hence, we are left with the question as to why the aforementioned distribution of risk and duration

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Table 1: Dynamics of Unemployment: Risk and Duration (West Germany)

Age Group	1 9 8 4 / 8 8		1 9 8 9 / 9 3	
	males	females	males	females
Risk[b]				
Below 20	22.7	28.0	21.6	23.1
20–24	28.7	25.1	25.0	19.4
55–59	14.8	14.9	13.0	13.9
<65	15.6	18.3	13.4	14.5
Duration[c]				
Below 20	16.5	19.1	12.1	14.4
20–24	18.6	22.0	15.1	17.1
55–59	44.0	54.5	52.7	67.1
<65	27.0	31.1	26.6	30.6

[a] see text for details, averages per year
[b] percentages
[c] weeks
Source: Bundesanstalt für Arbeit.

among age groups exists. A tentative explanation as to why males aged 20 to 24 years face a considerably higher risk than females may be that males can escape from unemployment by entering military service already at an age below 20 years. This only means, however, a postponement of the risk from the lowest age group to the next higher one.[2] The comparatively low duration of youth unemployment leaves it open whether such a short episode has long lasting effects on the later career. Hence, in section 4 we elaborate on this question by estimating earnings functions depending, among other variables, on unemployment experience at the beginning of working life.

In the presence of multiple spells of unemployment a distinction is in order between the duration per spell of unemployment and the duration of unemployment per person. Put differently, the first dimension times the number of unemployment spells per individual gives the latter dimension. Information on this issue with an emphasis on youth unemployment is not very rich for Germany. Karr and John (1989) still represents the most in–depth study. The authors base their investigation on all unemployed persons who received unemployment compensation during the time period July 1979 and June 1984, i.e. around 7.9 Mill. persons. In addition they match data from employment statistics to these data (the latter stemming from the unemployment benefits statistics) in order to capture those unemployed who are not entitled to unemployment benefits whatsoever. While the results of this study tend to be somewhat historical they are based on a huge

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[2]Note that figures on the labor force include soldiers.

Table 2: Cumulated Unemployment 1979–1984 (West Germany)

Age Group	Number of Persons (Mill.)	Number of Spells per Individual	Duration per Spell (Weeks)	Cumulated Duration (Weeks)
less than 20	1.965	1.14	17.9	20.4
20 – 24	2.260	1.86	18.4	34.2
25 – 29	1.440	1.96	22.2	43.6
30 – 54	3.723	1.86	25.7	47.8
55 – 59	0.665	1.20	46.7	55.8
all	10.053	1.71	23.7	40.5

Source: Karr and John (1989).

data set and represent somewhat more reliable information compared with case studies of a few hundred unemployed individuals.

Table 2 highlights some results of that study. Note that all numbers refer to the aforementioned five–year period, i.e. an unemployed youth aged less than 20 years had 1.14 spells of unemployment during the whole five–year time period. Each spell lasted 17.9 weeks, so that cumulated unemployment duration amounted to 20.4 weeks. Disregarding the lowest and the highest age groups, there is not so much variance in the number of spells per individual. By and large, the relation between age and number of spells follows the shape of an inverted U. This does not hold for duration per spell which increases with age.

In order to provide more recent empirical evidence on this aspect we carry out a similar analysis based on several waves of the German socio–economic panel covering the time period 1984 to 1993 (West Germany). While our calculations also refer to a five–year period they differ from those in Karr and John (1989) in that all persons are included who became unemployed at any point of time and could be observed for five years (Karr and John consider only those who at the beginning of the five–year period 1979 to 1984 became unemployed). As a consequence our figures are not strictly comparable to those obtained by Karr and John. The main reason for our approach is, of course, to obtain more observations, which remain small nevertheless. The number of spells per individual is lower then and amounts to 1.22 for youths aged less than 25 years, with a cumulated duration of 23.4 weeks displayed in table 3. As in table 2 there is no clear tendency that the number of spells unambiguously decreases with age, whereas the cumulated duration of unemployment is positively correlated with age.

2.2 Demand and Supply of Apprenticeship Training

Over the last two years concern about the supply of apprenticeship training positions has again taken center stage in the public discussion. Figure 4 reveals that

Table 3: Multiple Spells and Duration of Unemployment 1984–1993 (West Germany)

Age Group	Number of Persons	Number of Spells per Individual	Cumulated Duration (Weeks)
below 25	525	1.22	23.4
25 – 30	314	1.25	27.0
31 – 40	312	1.14	30.0
41 – 50	221	1.16	33.3
51 – 60	217	1.11	55.8

Source: German Socio–Economic panel, calculations by the authors.

no new developments have appeared on the market for apprenticeship training positions underlying this debate. Periods of an excess demand for apprenticeship training such as 1975–1978 and 1982–1986 were followed by periods of excess supply. Note that the numbers in figure 4 refer only to those positions and applicants registered at the labor office.[3] There is only very limited information on those employers and applicants who act without contacting the labor office.

As can be seen, the years after 1986 are characterized by a considerable excess supply with a peak in 1991. This helps to explain why unemployment rates of youths fall short of adult unemployment rates in this time period. The increase in demand for apprenticeship training positions in the first half of the eighties is due to the entrance of the birth cohort of the second half of the sixties ("baby boom") into the labor market. The decline in demand after 1984 is not only a consequence of smaller birth cohorts but also due to lower labor force participation rates. For example, participation rates of males aged less than 20 years fell from 45.8 percent in 1985 to 37.1 percent in 1993 (females: 39.6 percent to 32.8 percent) due to an increased demand for higher education. This issue will be taken up again in the next section. Reasons for the decreasing supply of apprenticeship training positions are, among others, increasing costs, institutional regulations, and a lower expected demand for qualified workers.[4]

2.3 From School to Work: Success or Failure?

What follows is a quantitatively oriented analysis of the transition process from school to work, including a brief description of major institutional regulations concerning vocational education. Special attention is given to those youths who at one point or another fail in the system. In addition, section 2.4 is entirely concerned with measures for those youths who fail or drop out of an apprentice-

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[3]"Supply" means the sum of new contracts for apprenticeship training and vacancies for apprenticeship training. "Demand" is defined as the sum of new apprenticeship training and applicants for apprenticeship who did not (yet) receive a contract.

[4]See Franz and Soskice (1995) and Winkelmann (1996) for a brief overview and analytical treatment.

Figure 4: Demanded and Supplied Apprenticeship Training Positions (West Germany)[a]

Supply

Demand
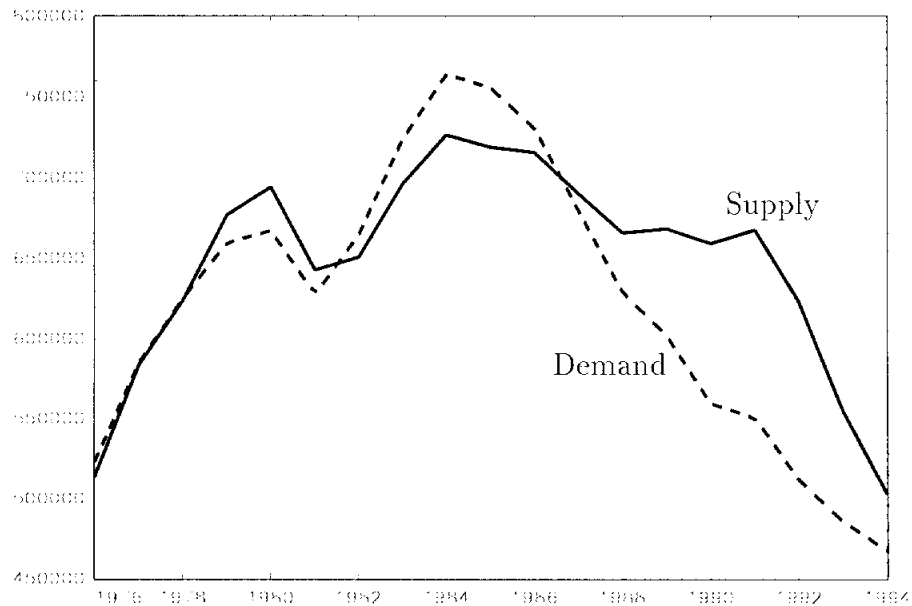
ship. While this section is based on an interpretation of various statistics and institutional regulations, an econometric analysis of some aspects of this transition process is relegated to section 3. In view of the numerous differences in the system, e.g. according to which state of the Federal Republic of Germany is under consideration, it goes without saying that only some stylized facts can be displayed here.

By and large, three stages of the educational process can be distinguished for the topics dealt with here:

(i) The transition process from the school system into apprenticeship training.

(ii) Dropouts and failures during apprenticeship training.

(iii) The transition to employment after apprenticeship training.

First Stage: Transition from School to Vocational Training

To begin with, three different school types and certificates of general education are distinguished in table 4 where all figures refer to West Germany in the year 1990.[5] All calculations in this table are based on a national accounts system for education (Bildungsgesamtrechnung). This system uses various aggregate flows and stocks and merges them with transition probabilities obtained from other sources (e.g. individual data sets) in order to get a consistent flow diagram for different types of school education, vocational training and the labor market. It is, however, set

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[5]This is the most recent figure available.

up for some years only.[6] Note that other flows will be discussed later such as flows from apprenticeship training or vocational schools (see table 12).

A nine or ten years lower secondary school (Hauptschule) education is compulsory for all youths aged seven to fifteen years unless they switch after four years, i.e. typically at the age of ten years, to a nine years gymnasium or a six years secondary school (Realschule).[7] The lower secondary school provides basic general education and provides a certificate (Hauptschulabschluß) to those who successfully pass all classes. The student at the gymnasium, after examinations, ends up with a certificate called "Abitur" which, in principle, entitles these youths to continue their education at a university or an advanced college of higher education (Fachhochschule). The secondary school also provides successful youths with a certificate (Mittlere Reife) which, for example, entitles its holders – provided that they have completed an apprenticeship training – to attend the aforementioned three year advanced college for higher education which is spezialized in fields such as engineering or business administration. These colleges differ from universities, not only due to their shorter period of education (three years), but also in that they attempt to provide education which is more oriented to application and practice.

As table 4 indicates, 236,000 youths left the lower secondary school in 1990. Note that "leaving" this school does not necessarily mean that all youths passed all classes of this school.[8] Those who fail in one class or another have to repeat the class, but may leave the lower secondary school after finishing the nine years compulsory full–time school period. Many of those youths, however, stay at this school in order to complete all nine classes successfully and to receive the lower secondary school leaving certificate (Hauptschulabschluß). In case of serious deficiencies some youths change from the lower secondary school to specialized schools for disabled persons. From the 236,000 lower secondary school leavers 59 percent embark on an apprenticeship training more or less immediately afterwards, 14 percent enroll in a preparation or elementary vocational year, 14 percent continue vocational education at special vocational schools, but 9 percent enter unemployment. Indeed, the transition from lower secondary school to apprenticeship training constitutes a major critical point. Moreover, the suspicion may be raised that an unknown share of youths involuntarily continue education.

Hence, the obvious question arises as to what happens with those youths without an apprenticeship training position. Whether they are employed or unemployed they nevertheless have to attend a part–time vocational training school which is compulsory until the age of 18 years, unless the youth departs for another school. "Part–time" usually refers to one full day per week. They may, however, continue education and the German vocational training system offers a variety of possibilities such as a preparation year for vocational training (Berufsvorbereitungsjahr) or an elementary vocational year (Berufsgrundbildungsjahr). The first alternative is a full–time school and especially designed to assist youths who found

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[6]For details see Tessaring et al. (1993).

[7]See a glossary of some features of the German educational system in Appendix D.

[8]In 1988 roughly 20 percent of all youths leaving (special) lower secondary schools did not have a lower secondary school certificate. Source: Bundesministerium für Bildung, Wissenschaft, Forschung und Technologie (1994), p.76.

Table 4: Transitions from General Education in West Germany 1990 [a] (Percentages)

Lower Secondary School (Hauptschule) 236,000 [b]	Secondary School (Realschule) 231,000 [b]	Gymnasium 177,000 [b][c]

	Apprenticeship Training	57 / 15
59 →		
14 →	Preparation/Elementary Vocational Year	5 / –
14 →	Special Vocational School/Gymnasium	31 / 4
2 →	Employment	4 / 38 (9)
9 →	Unemployment	2 / 1
1 →	Out of the Labor Force	0 / 6
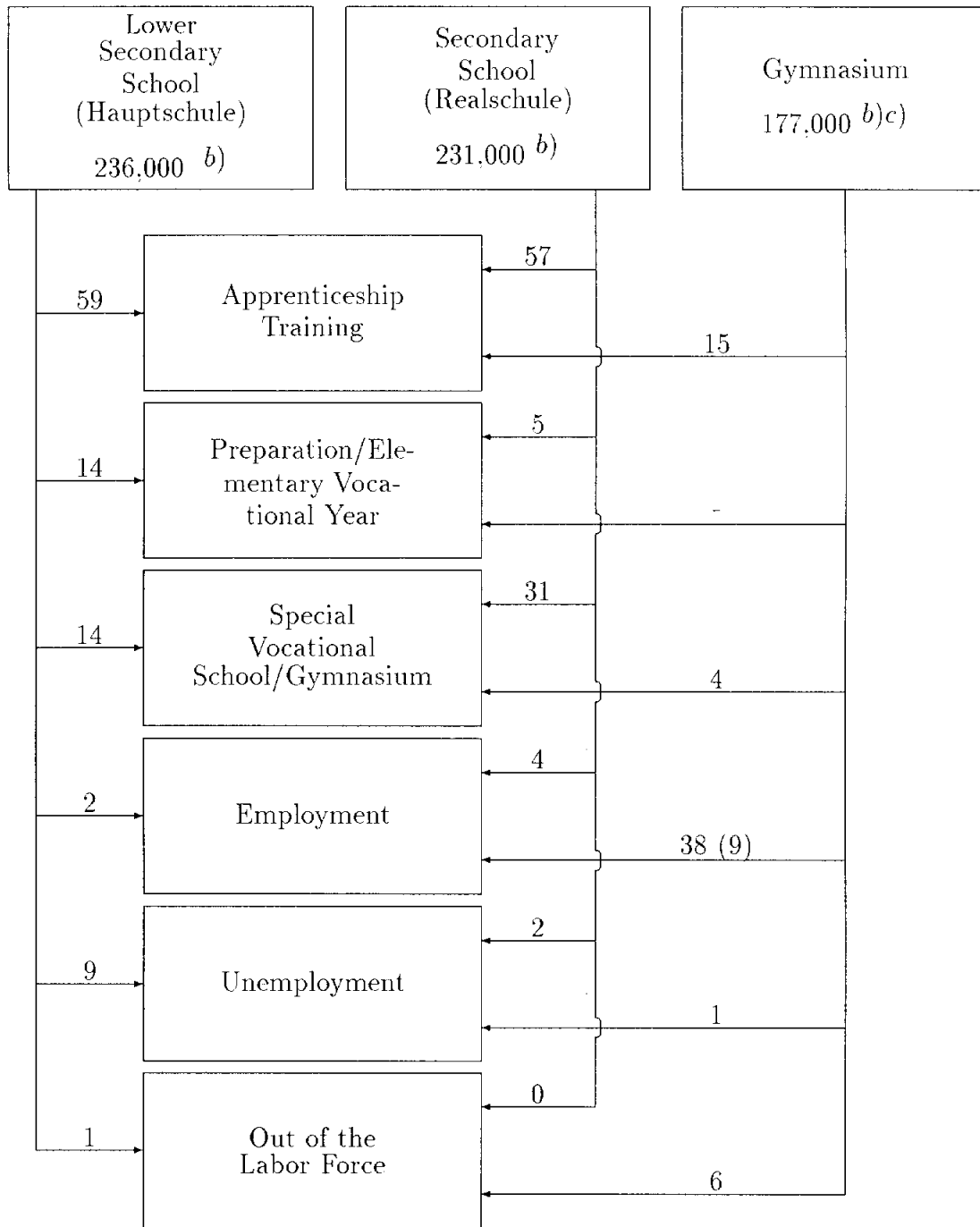
[a] see text for explanations. [b] persons. [c] 35 percent of these youth enter universities or advanced colleges for higher education.

Source: Institut für Arbeitsmarkt- und Berufsforschung (1993), p.17.

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Table 5: Youths in Vocational Education (Thousands)[a]

Year	In Vocational Schools	In Special (Higher) Vocational Schools	In Elementary Vocational Year		In Preparation Year for Vocational Training
			Full-Time	Part-Time	
1980	1848	326	66	14	42
1985	1893	330	80	16	36
1990	1469	246	37	47	26
1993	1323	246	30	63	32

[a] 1980–1990: West Germany. 1993: West Germany and East Berlin
Source: Bundesministerium für Bildung, Wissenschaft, Forschung und Technologie (1994), p. 48.

it difficult to obtain an apprenticeship by offering a broad pre–vocational training. On the other hand, the elementary vocational year, which is now mostly part-time schooling (see table 5).[9] provides instruction in subjects common to a range of similar occupations and replaces six to twelve months of normal apprenticeship training. To some unknown extent both variants of preparation years serve as a "waiting–loop" for school–leavers without an apprenticeship contract. As a third example, those youths who leave the lower secondary school with a leaving certificate may attend a usually one–year, full–time special vocational school (Berufs-fachschule). Although in some of these (higher) special vocational schools youths receive a complete education such as medical–technical assistant, the great majority of these schools are of a kind where attendance counts towards the training period in a recognized skilled occupation and among these there is a preponderance of the clerical–administrative variety (known as commercial schools) and a second type providing training for home economics or social care occupations. An exceptionally high proportion of students (roughly two–thirds) are females and want to continue their training in the dual system.[10]

We are now in a position to quantitatively take a closer look at those lower secondary school leavers in table 4 who undergo training within the "preparation year for vocational training" and the "elementary vocational year" or attend (higher) special vocational schools. What do these youths do after this time period? Our own calculations based on the socio–economic panel reveal that more than half of these youths enter an apprenticeship training afterwards, although this result should be taken with some caution due to the low number of persons involved.

As is displayed in table 4, 9 percent of those youths who leave the lower secondary school (with or without a certificate of successful completion) enter the

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[9]The shift towards the part–time form of the elementary vocational year since the second half of the eighties may, to some extent, stem from the emphasis which has been laid on this school type by several employers' associations; see Münch (1991), p. 113.

[10]See Münch (1991), pp. 122–123.

Table 6: School and Employment Status of Lower Secondary School and Secondary School Leavers in West Germany (Percentages)

School cohorts 1984–1993	After one year				
	School	Vocational training	Employed	Unemployed	Not in labor market
Males	25.0	57.3	7.9	2.2	7.6
Females	19.9	60.0	7.1	2.4	12.1
German	22.2	66.2	4.5	2.0	5.1
Foreign	23.3	45.8	11.5	3.4	16.0
Total	22.5	57.6	7.5	2.6	9.8

School cohorts 1984–1989	After five years				
	School[a]	Vocational training	Employed	Unemployed	Not in labor market
Males	5.7	16.3	63.8	9.9	4.3
Females	1.6	16.8	60.0	8.0	13.6
German	5.2	27.2	59.4	6.5	7.1
Foreign	1.8	9.0	65.8	12.6	10.8
Total	3.8	16.5	62.0	9.0	8.6

a) university or advanced college for higher education

Source: German Socio–Economic Panel, calculations by the authors.

unemployment pool.

Going back to table 4, the second major school type is the Realschule or secondary school. The typical youth enters this school after completing the first four years of the elementary school, i.e. at the age of 10 years. Schooling at the secondary school lasts six years and culminates, after examinations, with a secondary school leaving certificate. Some more ambitious apprenticeship training positions more or less formally require such a certificate. As can be seen from table 4 slightly more than one half of all secondary school leavers enter apprenticeship training. By and large, the remaining school leavers continue education. Compared with the leavers from the lower secondary school only a small fraction of secondary school leavers enter unemployment.

Table 6 shows the status of school leavers from lower secondary and secondary school one year and five years after they have left school. One year after completion of general education, about 80 percent are still in school or in vocational training. Only about 7.5 percent of them are employed. Five years after completion of general education 16.5 percent are still in vocational training and 3.8 percent attend university or an advanced college of higher education.

Finally, the third school type is the nine year gymnasium. Like the secondary school youths enter the gymnasium school after four years elementary school and leave it at the age of 19 or 20 years or so. As has been mentioned the gymnasium

awards, after examinations, a certificate called "Abitur" which entitles entrance to universities. Some 16 percent of all gymnasium leavers, however, decide to undergo apprenticeship training first, as table 4 indicates. For example, they obtain an apprenticeship training at a bank and after that they study business economics (perhaps with an emphasis on banking). The largest group of gymnasium leavers (37 percent) continues school education mostly at universities (28 percent). Some 6 percent become employed and 30 percent join military service, voluntarily or involuntarily, or community service (in lieu of military service). Roughly 4 percent become unemployed and 7 percent leave the labor force. The latter group mostly consists of females.

The majority of youths experience a smooth transition from school to vocational training. One reason for this is their high flexibility towards their future occupation. In 1994/95 65 percent of youths named more than one occupation they wanted to get training for, 28 percent named even more than three occupations. Roughly 51 percent started an apprenticeship training in an occupation that was not their favorite one. The tables 7 and 8 show the ten most desired occupations of young males and females one or two years before completion of schooling and the ten most frequent newly concluded apprenticeship training contracts. Besides the differences between males and females, the high flexibility of youth in the transition process can be seen.

Taken together, in 1990 about 12 percent of all youths did not experience a smooth transition from the three school types under consideration into apprenticeship training or further education and another 7 percent dropped out of the labor force. With respect to the first group, the labor offices offer several measures to assist school leavers such as vocational counselling, matching seekers for apprenticeship training to such positions (as far as they are registered at the labor office), and providing financial aid not only to enable youths to receive an apprenticeship training (such as reimbursing costs for applications or moving) but also to maintain their livelihood during apprenticeship training if he does not live with his parents, is at least 18 years old or is married. A description and quantitative assessment of measures for the "hard-to-employ" is relegated to section 2.4.

Failures in the transition from school to apprenticeship training have long lasting effects on the later occupational career. Table 9 takes a closer look at those transitions by distinguishing two groups of persons in the age 20 to 24 years category depending on whether they had a complete vocational training in 1988. For each group it was then investigated what they had done immediately after school (being then 14 or 15 years of age). For example, 10 percent of those persons who completed vocational training in 1988, did not embark on an apprenticeship training immediately after school but first had a job without qualification requirements. The data are based on a special survey of youths aged 20 to 24 years taken in West Germany around 1988. Each group consists of about 1,800 youths. Some 54 percent of those without completed vocational education failed already in the transition from several types of schools such as (lower) secondary schools, in that they embarked on a job which did not require further vocational education. This figure stands in marked contrast to the respective 10 percent of those with complete vocational education. Thus, the suspicion may be raised that those early failures represent "permanent scars rather than temporary blemishes"

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Table 7: Desired occupations and newly concluded apprenticeship training contracts of male youth 1994/1995[a]

	desired occupations	percent	new apprenticeship training contracts	percent
1	Motor vehical mechanic	18.6	Motor vehical mechanic	6.8
2	Joiner/Woodworker	12.4	Bricklayer/ Skilled construction worker	6.8
3	Bricklayer	11.0	Joiner/Woodworker	5.4
4	Bank clerk	9.8	Electrician	4.9
5	Electrician	9.1	Painter / Varnisher	4.6
6	Mechanical Electrician	8.3	Industrial worker	4.0
7	Office clerk	7.2	Plumber/ Fitter	3.6
8	Radio/Television technician	5.6	Import/Export and Wholesaler trader	3.4
9	Carpenter	5.4	Retail trader	3.1
10	Draughtsman	4.8	Industrial clerk	2.6

[a] see text for explanations

Table 8: Desired occupations and newly concluded apprenticeship training contracts of female youth 1994/1995[a]

	desired occupations	percent	new apprenticeship training contracts	percent
1	Office clerk	14.5	Office clerk	10.7
2	Doctor's assistant	14.4	Doctor's assistant	7.6
3	Bank clerk	10.8	Retail trader	6.7
4	Hotel manageress	9.4	Dental assistant	6.3
5	Hairdresser	8.3	Hairdresser	6.1
6	Animal keeper	7.7	Industrial clerk	5.0
7	Veterinary assistant	7.6	Bank clerk	4.2
8	Florist	6.3	Sales assistant Food industry	4.0
9	Photographer	6.0	Lawyer's/ Notary's clerk	4.0
10	Shop assistant	5.9	Hotel manageress	3.5

[a] see text for explanations

Table 9: Transitions from School by Vocational Education 1988 (West Germany) (percentages)[a]

Previous exits after school into ...	Persons with or without completed vocational education in 1988	
	with	without
– jobs without qualification requirements	10	54
– apprenticeship training	64	16
– unemployment	1	4
– further education	22	21

[a] see text for explanations

Source: Bundesminister für Bildung und Wissenschaft (1991). p. 33, 35.

(David Ellwood). This is also evidenced by the next transitions of these youths without completed vocational education. From those who had a job some 27 percent changed to another job (again without further requirements with respect to vocational education), 13 percent entered the unemployment pool, 6 percent temporarily had an apprenticeship training, and 11 percent took up further vocational training, unsuccessfully however.

Table 10 highlights that failures in receiving an apprenticeship training stem from both sides, supply and demand. Figures are based on the same survey mentioned before and include youths aged 20 to 24 years who do not have a completed vocational education. A distinction is made between whether these youths looked for an apprenticeship training or not. Both groups of youths were asked for their reasons for not embarking on apprenticeship training. For example, 57 percent of youths who had been looking for an apprenticeship training did not start such a training due to a lack of offers in the desired occupation.[11] but this figure is clearly overshadowed by "poor performance" as the major reason for not starting an apprenticeship training. In total (and not displayed in table 11) 56 percent of youths without completed vocational education did not search for an apprenticeship training and reasons for that can mainly be found in individual circumstances such as poor performance, unwillingness for further learning, lacking ideas about what to do, and family formation.

Second Stage: During Vocational Training

As has been pointed out in the previous section, inflows into apprenticeship training stem from various school types. This is also highlighted by table 11 which

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[11]These who did not look for an apprenticeship training answered this question, too. This may be due to anticipations (correct or not).

Table 10: Reasons for not Starting an Apprenticeship Training [a] 1988 (percentages)

Reason	Search for an Apprenticeship Training	
	Yes	No
poor performance (certificate, tests)	65	35
no interest in further learning	7	30
no offer of apprenticeship training in desired profession	57	10
no offer at all	41	15
no idea about what type of profession	9	25
more labor income wanted	12	21
marriage, pregnancy	8	19
no confidence in himself/herself	4	15

[a] see text for explanations; multiple answers possible.

Source: Bundesminister für Bildung und Wissenschaft (1991), p. 49.

differentiates trainees according to their level of school education. The age structure of the apprenticeship trainees mirrors school leaving dates and shows that the traditional picture of the 15 year old youth leaving lower secondary school and embarking on apprenticeship training is not (or at least: no longer) a representative description of reality. In 1990, around one quarter of all apprenticeship trainees were less than 18 years of age, the respective figures for 1980 and 1960 are 52 and 82 percent, respectively.[12] The average age of an apprenticeship trainee increased from 16.6 years in 1970 to 19.0 years in 1993.[13] Our own calculation on the basis of the socio–economic panel displays that in West Germany during the time period 1984 to 1993 the average age of youths successfully finishing apprenticeship training increased from around 22 to 24 years. There are several reasons for this change:

(i) In the past decade there was a higher tendency for an increasing number of leavers from the gymnasium to undergo firstly an apprenticeship training before entering, say, university (see table 5 for the respective flow in 1990). Not only have qualification standards for several professions risen, so that a completed (lower) secondary school is no longer sufficient, but, in addition firms increasingly value work experience of academics leaving universities.

(ii) Those males with higher school experience increasingly try to get their military service finished before embarking on apprenticeship training in order to ensure a smooth transition from training to work.

Table 11: Apprenticeship Trainees by School (percentages)

	1983	1989	1993
Without lower secondary school leaving certificate	3.0	2.5	3.5
With lower secondary school leaving certificate	39.9	35.5	34.2
Preparation year for vocational training, basic vocational year	4.4	6.2	4.9
Special vocational school	11.1	10.2	7.9
Graduation from secondary school	31.7	31.8	35.8
Graduation from gymnasium	8.4	13.8	13.7

Source: Berufsbildungsbericht 1985, p. 38; 1991, p. 36; 1995, p. 56.

In the course of apprenticeship training three sources of malfunctioning may arise: The trainee changes the type of vocational training or the firm providing

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[12]Source: Berufsbildungsbericht 1995, p.56 (figure for 1990 includes East Germany).

[13]Source: Berufsbildungsbericht 1991, p. 40.

such a training, the trainee drops out either to take up full-time school education or to become (un-)employed or to leave the labor force, or finally the trainee fails to pass examinations. To begin with, aggregate data on premature terminations of training contracts as a percentage of annually newly signed contracts (averaged over three previous years) display an average figure of 16.2 percent for the eighties with a range between 14.4 percent (1982) and 21.2 percent (1989),[14] where the first year falls into the then recession, while 1989 is characterized by much better economic conditions. In the boom year 1991 we observe a figure of more than 24 percent. Thus the suspicion may be raised that the premature terminations are procyclical. Moreover, in 1989 some 83 percent of all premature terminations were initiated by the trainee. Reasons in declining order of importance are difficulties with the trainers or entrepreneurs, dissatisfaction with the chosen profession, another more promising training firm, deficiencies in training courses, duties which have nothing to do with vocational training. Premature terminations are above average in small and medium sized firms.

Finally, the overwhelming number of trainees succeed in final examinations. The average percentage of passed exams is about 90 percent in the eighties with a slightly decreasing trend.[15] Those who fail are allowed to repeat, of course. Information on those trainees who definitively fail is sparse, however.

Third Stage: After Vocational Training

In order to give a first impression table 12 summarizes transitions from apprenticeship training system into the labor market or the school system for 1990. This year has been choosen to facilitate comparison with table 4. Note, however, that the data do not permit distinction of whether the trainee successfully completed his or her training. Calculations are again based on the national accounts for education. The majority of some 78 percent of all trainees get a job, but more than 11 percent become unemployed or leave the labor market. Unsurprisingly, transitions into the labor market exhibit a cyclical pattern. For example, the transition into employment declined in the recession years 1982/83 to about 70 percent, but increased to 76 percent in the boom year 1990.

More information can be gained from individual data sets. Table 13 presents our own calculations using the third wave (taken in 1991/92) from a data set collected by the Federal Institute of Vocational Education ("Bundesinstitut für Berufsbildung", BiBB). People born between 1960 and 1970, i.e. aged between 32 and 22 years when the survey was taken, were interviewed about personal characteristics, school and work history, and the like. Their school and work experience covers the time period from around 1975 on. In total, the data set contains 4651 youths leaving (lower) secondary school. About 64 percent completed training successfully and the majority of them were employed in the same firm afterwards. On the other side, some 40 percent of those who failed in the training system became unemployed.

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[14]Source: Berufsbildungsbericht 1991, p. 42.
[15]Source: Tessaring (1993), p. 136.

Table 12: Transitions from Apprenticeship Training and Vocational Schools 1990
(West Germany)

```
                  ┌──────────────────────────────────────────┐
                  │     Apprenticeship Training System        │◄──────────51──────────┐
                  └──────────────────────────────────────────┘                        │
                                     │                                                 │
         ┌───────────┬───────────────┼───────────────┬───────────────┐                │
         │           │               │               │               │                │
       78 a)         4               8               3               7                │
         ▼           ▼               ▼               ▼               ▼                │
   ┌─────────┐ ┌─────────┐ ┌──────────────┐ ┌──────────────┐ ┌──────────────┐        │
   │  Em-    │ │ Unem-   │ │  (Higher)    │ │ University/  │ │ Out of the   │        │
   │ ployment│ │ ployment│ │ Vocational   │ │  Advanced    │ │   Labor      │        │
   │         │ │         │ │  Schools     │ │  College     │ │   Market     │        │
   └─────────┘ └─────────┘ └──────────────┘ └──────────────┘ └──────────────┘        │
        ▲           ▲              ▲               ▲               ▲                  │
      16 a)         3             10               5               1                  │
        │           │              │               │               │                  │
        └───────────┴──────────────┼───────────────┴───────────────┘                 │
                                    │                                                  │
                        ┌───────────────────────┐                                      │
                        │   Vocational Schools  │──────────────────────────────────────┘
                        └───────────────────────┘
```
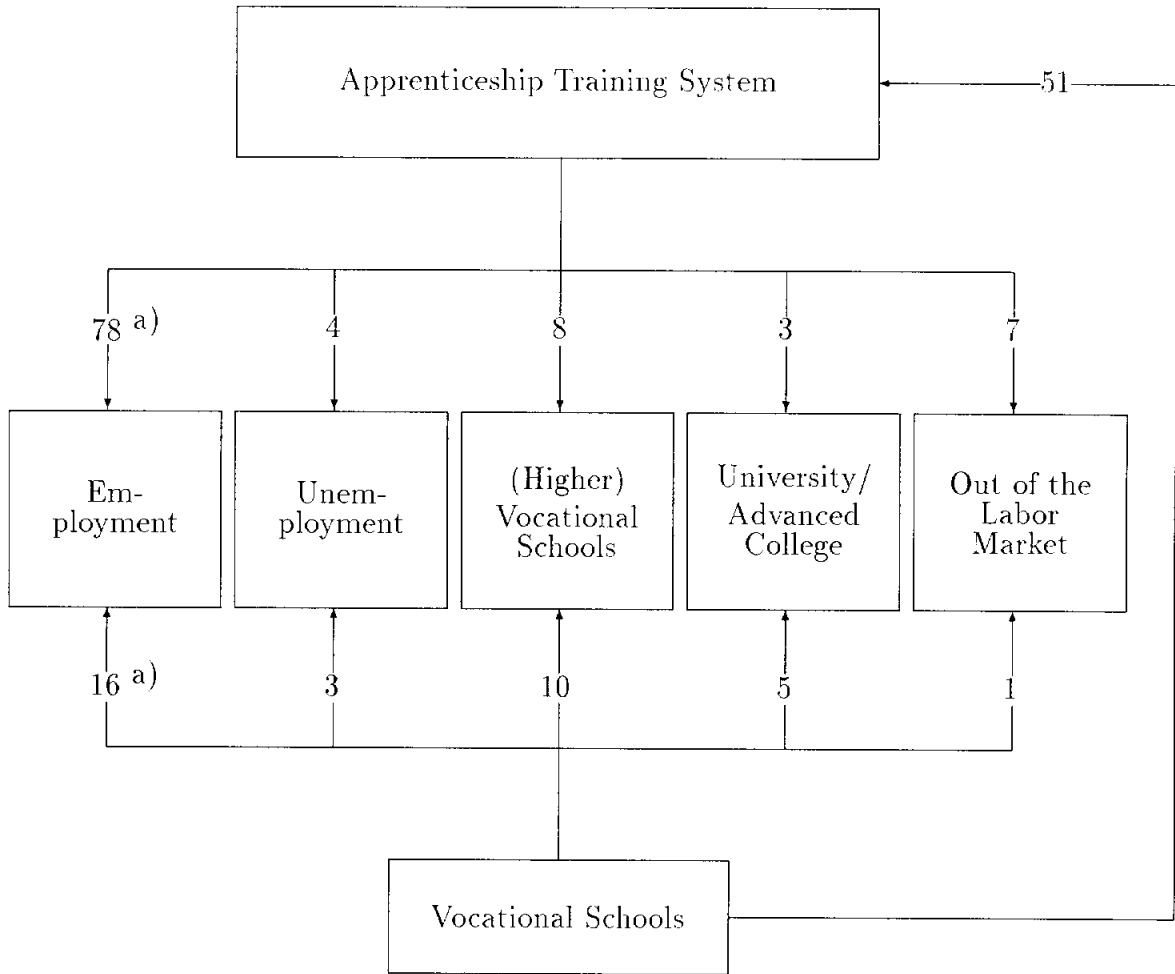
a) Including military service and community service

Source: Institut für Arbeitsmarkt- und Berufsforschung (1993), p.19.

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Table 13: Transitions from School to Work 1975–1991 (West Germany)[a]

```
                    ┌─────────────────────────────┐
                    │   (Lower) Secondary School  │
                    │            4651             │
                    └──────────────┬──────────────┘
                                   │
                                   ▼
                    ┌─────────────────────────────┐
                    │    Apprenticeship Training   │
                    │     2978          64.0       │
                    └──────────────────────────────┘
                        /                       \
                       ▼                         ▼
        ┌──────────────────────┐      ┌──────────────────────┐
        │    Successfully      │      │    Not Completed     │
        │    Completed         │      │                      │
        │  2866        96.2    │      │  112         3.8     │
        └──────────────────────┘      └──────────────────────┘

              ┌──────────────────────────────────────────┐
              │           Employed (total)               │
              │   2547/88.9             38/33.9           │
              │   ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─      │
              │     Employed in the Training Firm         │
              │   2025/79.5             5/13.2            │
              └──────────────────────────────────────────┘

                    ┌─────────────────────────────┐
                    │         Unemployed          │
                    │  120/4.2         45/40.2    │
                    └─────────────────────────────┘
```
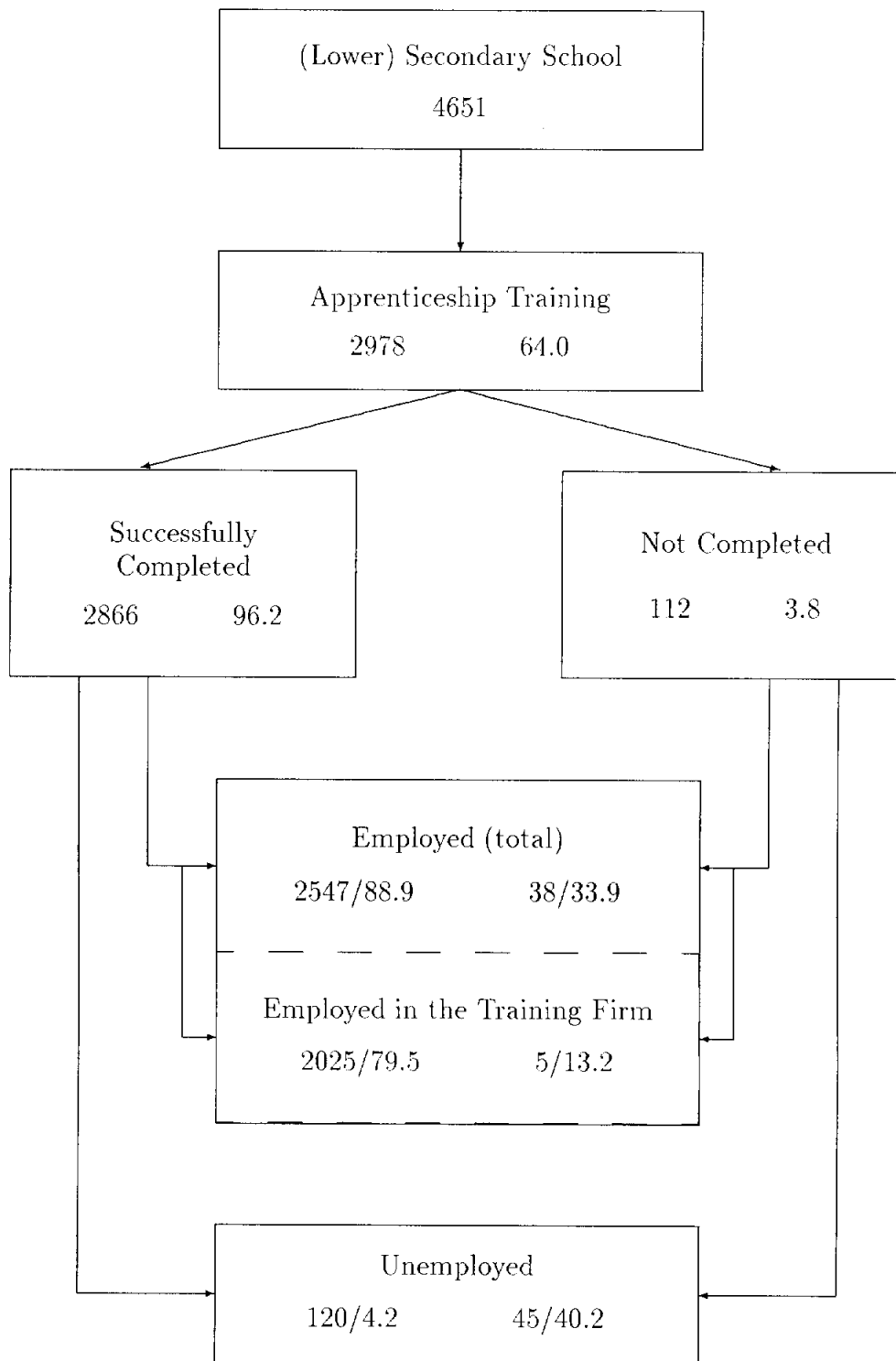
[a] See text for description; first number represents number of persons.
second number: percentages of directly preceding status

Source: Bundesinstitut für Berufsbildung; calculations by the authors.

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2.4 Special Measures for the "Hard-to-Employ"

This section is entirely devoted to an overview and assessment of measures especially designed for special groups on the youth labor market. The major question to be dealt with is how to make the less and the least able youths reasonably productive.

Three types of measures are offered:

(i) Pre-vocational measures for those youths who have not yet found an apprenticeship training.

(ii) Special measures for handicapped youths.

(iii) Special measures for youths without a reasonable school experience and/or with social problems.

To begin with, pre-vocational measures aim to assist young persons during the transition process from school to apprenticeship training. These youths are not necessarily disabled but need some orientation and basis to prepare for vocational education. These measures include, firstly, a basic training in order to find an adequate vocational training for the youth in question, secondly, special classes for youths with physical or mental deficiencies who are not yet ready for a vocational training but who may, in principle, be considered for vocational training, and, thirdly, courses for information and motivation for those youths who are on the brink of dropping out of vocational life or have done so already. Taken all three measures together, some 68,000 youths entered such a pre-vocational training in West Germany in 1994 with an emphasis on the second type of measures. This figure amounts to roughly 15 percent of those who started an apprenticeship training in that year.[16]

The second type of measures are exclusively concerned with mentally or physically disabled youths. These measures provide either a vocational training or a vocational reintegration into work by further training or recruiting. The overwhelming share of all this training takes place in special training schools and workshops for disabled youths and is mostly concerned with recruiting. The number of disabled youths who left one of these measures in West Germany in 1993 amounted to about 38,000 persons. Of these, some 70 percent completed this training successfully in that they passed examinations in order to receive a certificate in an officially recognized profession. Some of the rehabilitation centers which provide such a training report that in 1993 about 72 percent of all disabled youths got employment afterwards, some 18 percent became unemployed, and the remaining persons could not be integrated into the labor market.

The third type of measures is mainly devoted to an assistance of youths during an apprenticeship training who have difficulties coping with apprenticeship training due to school deficiencies and/or social problems. For the most part these measures take the form of accompanying courses while the youth stays in apprenticeship training. By the end of 1994 around 75,000 disadvantaged youths were subject to these measures in West Germany.

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[16]Source for figures in this section: Berufsbildungsbericht 1995, pp.77–84.

Taken together and referring to West Germany in 1993, around 150,000 hard-to-employ youths were covered by measures described in this section. To get an impression of this magnitude, at the same time about 1.3 million youth were apprentices. Note, however, that both figures have about 50,000 persons in common.

3 Finding the First Job

Referring to the third stage mentioned above, economists generally agree that the German vocational training system is rather efficient in preventing youths from becoming unemployed. However, there is little empirical evidence on the effectiveness of the system to place youths into a stable and adequate employment. Therefore this section focuses on the duration of non-employment after the participation in a formal vocational training program. This formal training can be a traditional apprenticeship training program within the dual vocational training system (consisting of education in public vocational schools and vocational training within a firm) or some other vocational training that is solely offered in profession–specific vocational schools. Schools of this type include schools for professions in the health care system (Schulen des Gesundheitswesens), special vocational schools[17] and schools for the civil service (see the glossary in Appendix D for details).

In the following empirical study we take a closer look at the process of growing into work in general by analyzing the duration of non–employment after graduation from a vocational training program, as well as the duration of youth unemployment for those who declare themselves as being unemployed. We define a non–employed youth as someone who is either unemployed or out of the labor force. The latter group of people, for instance, consists of youths participating in a brief additional vocational training program (without receiving an official degree from it) or youths who, for some reason, are not willing to search for a permanent job, e.g. because they plan to continue schooling in the near future. On the other hand the subsample of unemployed can be regarded as the sample of those individuals who are likely to be more restricted in their choice set. However, our measure of unemployment is rather weak since we have to define an unemployed youth as somebody who is registered as being unemployed at the labor office. Since the registration at the labor office is, for example, a prerequisite for the parents to receive child support benefits (Kindergeld) this measure captures to some extent individuals who are not actively searching for a job, as well. For simplicity we disregard compulsory military service (or alternative service) as a specific option to escape the non-employment pool and compute the length of non-employment spell net of the military service.

The first step into the labor market is likely to be the most crucial one. Hence we focus on the first spell of non–employment (unemployment) after the completion of a formal vocational training using a subsample of the German Socio-Economic Panel (GSOEP) for the years 1984 to 1992. The sample consists of 1,071 individuals aged between 17 and 30 who have successfully completed their final

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[17]These schools train young people to become, for example, a bilingual secretary, interpreter or children's or old people's nurse.

Figure 5: Baseline Hazard Rate for a Representative Youth

percent

months
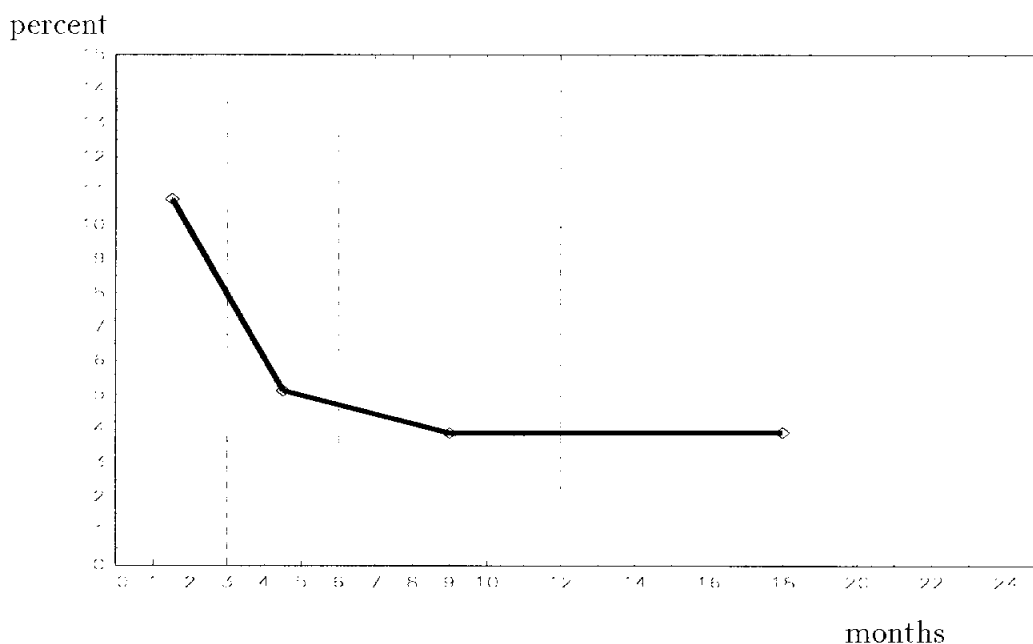
Source: German Socio-Economic Panel; calculations by the authors based on estimates displayed in table 14.

vocational training program. A more detailed description of the data construction and some basic descriptive statistics of the sample are given in Appendix A of the paper. Our estimates are based on the proportional hazard function approach proposed by Han and Hausman (1990) for grouped durations. The estimation of this model does not require a parametric specification of the baseline hazard. Moreover, unlike Cox's (1972) partial likelihood method the Han-Hausman approach can easily tackle the problem of ties as well as the inclusion of parametric heterogeneity. For the case of individual heterogeneity resulting from an exponentially distributed individual effect it can be shown that the log-likelihood is that of a conventional ordered logit model (without censory). The additional nuisance parameter due to the exponential compounder is not separately identifiable and is estimated as a part of the nonparametric baseline hazard.

Figure 5 depicts the shape of the baseline hazard of a representative youth based on estimates displayed in table 14. The probability of finding a job after the completion of a vocational training program decreases sharply in the first few months and remains fairly constant afterwards, i.e. youths who do not have luck finding a job shortly after their graduation from the vocational program have to face a comparatively long episode of non–employment. The low hazard rate for the long-term non–employed points to a potential malfunctioning of the youth labor market which does not offer great chances of a successful transition from school to work.

The estimated effects of the covariates on the hazard function are given in table 14 where a positive coefficient implies a positive impact of the corresponding variable on the duration of non-employment. Our results show that being parti-

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Table 14: Parameter Estimates of the Grouped Hazard Rate Model – Dependent Variable: Duration of Non–employment[a]

Variable	Coefficient	t–value[b]
Socio Economic Background		
AGE/100	- 13.57	- 2.7
SEX	0.00	0.0
NATIONALITY	- 0.02	- 0.1
FAMILY STATUS	- 0.07	- 0.2
HANDICAPPED	0.54	2.2
General Educational Background *(No Certificate[c])*		
LOWER SECONDARY. SECONDARY SCHOOL	- 0.69	- 2.3
ENTITLEMENT FOR ADV. COLLEGES. GYMNASIUM	- 1.08	- 2.7
Type of Vocational Training *(Special Voc. School)*		
APPRENTICESHIP	- 1.40	- 4.3
HIGHER VOCATIONAL SCHOOL	- 0.84	- 2.2
VOC. SCHOOL: CIVIL SERVICE	- 1.97	- 2.7
OTHER VOC. TRAINING incl. HEALTHCARE	- 0.33	- 0.9
Socio Economic Background of the Head of the Household		
HOUSEHOLD HEAD NOT MISSING	1.67	1.6
AGE	- 2.49	- 1.4
SEX	0.56	1.2
FAMILY STATUS	- 0.15	- 0.4
Voc. Background of the Head of the Household *(Non–employed)*		
BLUE COLLAR W. WITHOUT FORMAL TRAINING	- 0.87	- 2.8
BLUE COLLAR W. WITH FORMAL TRAINING	- 0.64	- 2.0
FOREMAN. SENIOR CRAFTSMAN	- 1.15	- 2.6
WHITE COLLAR W. WITH LOW TRAINING	- 0.90	- 2.7
WHITE COLLAR W. WITH HIGH TRAINING	- 1.01	- 2.1
CIVIL SERVANT	- 0.14	- 0.3
SELF–EMPLOYED	- 0.72	- 1.8
REPLACEMENT RATIO	- 1.18	- 1.4
Mean Log Likelihood	- 0.5391	
Number of Observations	1071	

[a] Reference categories in brackets.

[b] Robust t-values based on the sandwich form of the variance covariance estimates.

[c] Contains very few persons who obtained instruction at some other schools not included in the following categories.

cularly young turns out to be a severe handicap for finding the first job. Looking at employment probabilities of apprentices, Helberger et al. (1994) cannot find significant evidence for a commonly supposed discrimination against foreign and female youths. Our estimates point in the same direction. Although there is no significant difference between foreign and German youths in terms of the probability of finding a job foreign youths can be regarded as less "choosy" with respect to the quality of the job. While more than 80 percent of German youths find a job for which they have been trained in the vocational training program the corresponding figure for foreign youths is 66 percent. Hence the difference in the labor market entry behavior of German and foreign youths is characterized by a different choice between the short–run gains of a quick escape into employment and the long–run gains of choosing a job corresponding to the vocational training received with a lower probability of unemployment and higher earnings in later stages of the career. Such a search strategy might be reasonable for foreign youths who plan to re–imigrate to their home countries where they cannot expect significant positive returns from the vocational training program.

Although a number of statutory measures to promote employment for the handicapped exist, physical disability significantly reduces the chances of finding a job. Of little surprise is the effect of the level of general education on the duration of unemployment. Those with the highest schooling (gymnasium, entitlement for advanced colleges for higher education) face significantly shorter episodes of non-employment than youths holding no general educational degree from a German school. This finding clearly contradicts the notion that employers are sometimes reluctant to employ "overqualified" workers who hold a degree that qualifies for an academic profession.

Youths being trained within the dual system reveal significantly shorter spells of non–employment after the vocational training than those who are trained in any other vocational school. This, however, is only limited evidence for the hypothesis that the dual system is an efficient vehicle to promote employment for youths because the dummies for the type of vocational training proxy the occupational demand conditions as well.[18] Moreover, in contrast to the other types of vocational training programs an apprenticeship guarantees a first employment relationship during the training period. In the last decade around 80 percent of apprentices stayed with the training firm after completion of the apprenticeship.[19] In comparison to youths who solely receive their training in conventional vocational schools, graduates from higher vocational schools (Fachschulen für Meister, Technikerschulen) and vocational schools for the civil service can expect a quick start into employment. For the latter group this is mainly due to the fact that the public sector adjusts the recruitment of apprentices to its own demand for skilled employees.

Most interesting are the effects of the family background variables. The occupational status is a decisive determinant of the length of the non-employment spell. We are able to distinguish between various levels of occupational states of
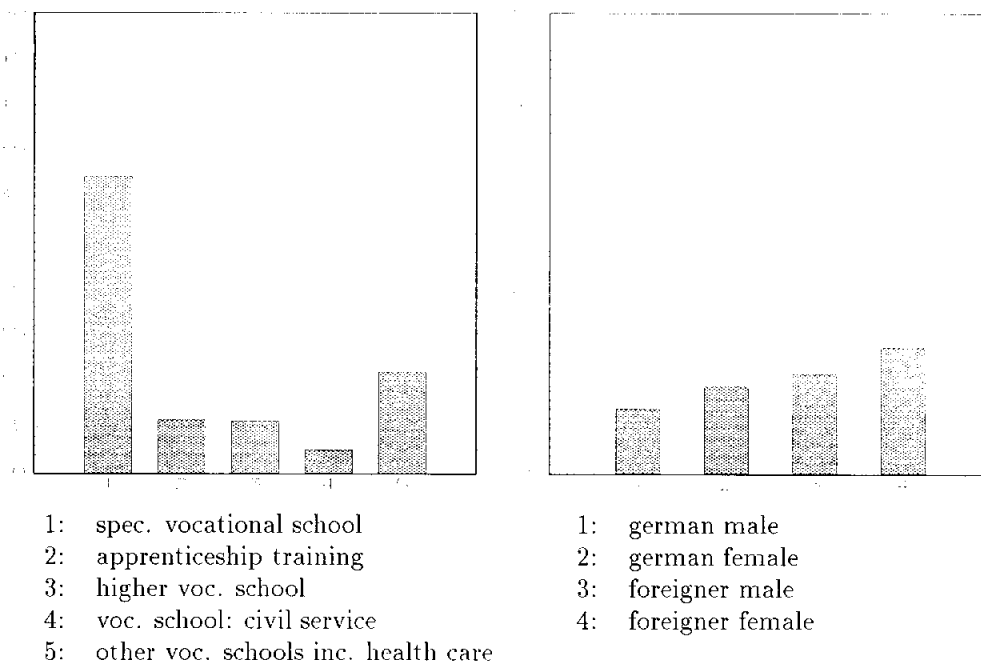
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[18]Unfortunately, given our data source, we are not able to distinguish between individuals of the same occupational degree by their training background (apprenticeship within the dual system vs training in occupational training centers).

[19]See table 13 and Harhoff and Kane (1995).

Figure 6: Twelve Months Average Survival Probabilities in Non–Employment

percent

1:	spec. vocational school	1:	german male
2:	apprenticeship training	2:	german female
3:	higher voc. school	3:	foreigner male
4:	voc. school: civil service	4:	foreigner female
5:	other voc. schools inc. health care		

the household head. Using "non–employed household head" as the reference category, we find that children of blue collar workers are more likely to escape from the non–employment pool than children of non–employed parents. In particular, children of highly qualified blue–collar workers (foremen and senior craftsmen) have the greatest chances of finding a job. A similiar pattern can be observed for the youths with a parent belonging to the group of white–collar workers. Here again, we find a positive correlation between the qualification of the parent and the likelihood of finding a job. To some extent our estimates support the notion that apprenticeship positions serve as a partial gift exchange where the qualified staff receives an extra premium by favoring children of staff members in the recruitment process. In particular, such a policy is well–known for large companies. This view is also supported by the estimates for the remaining two parental background variables. Youths of self–employed parents or civil servants do not reveal significantly better chances of finding a job than children belonging to the reference group. Other parental background variables, such as gender of the household head, age, marital status or the dummy whether there is information on the household head in the sample at all, do not significantly contribute to the explanation of the duration of non–employment.

Graduates of an apprenticeship program are eligible for unemployment benefits while graduates of a vocational training program outside the dual system are not. This suggests that the type of vocational training has an decisive impact on the youth's reservation wage. Using the replacement ratio as a crude measure for the opportunity costs of not working we cannot find any positive impact of the level

of unemployment benefits on the duration of non–employment.[20]

In order to assess the relevance of long–term unemployment for specific sub-groups we compute the average predicted probability of long-term non-employment (i.e. duration of non–employment for more than a year). In figure 6 we distinguish by the type of vocational training. With an average long–term non–employment probability of more than 30 percent. youths who were trained in a special vocational school outside the dual system (Berufsfachschule) are the ones who are most likely to face long–term non–employment. Supposingly. this reflects the rather limited opportunities for these graduates. On the contrary. graduates of the other training schemes face a much lower average probability of long–term employment.

Also in figure 6 we repeat the exercise by comparing the average predicted probability of long–term non–employment distinguished by gender and national-ity. Although neither the coefficient of the gender dummy nor the coefficient of the nationality dummy are significant a comparison of the average predicted prob-ability of long–term non–employment for the four subgroups reveals substantial differences in the employment chances. While the average probability of long–term non–employment for German males is 7.03 percent the corresponding figure for foreign females is almost twice as high (13.7 percent).

In a final step, we try to detect the hard–to-employ by looking at socio-economic characteristics of the youths who reveal a significantly higher proba-bility of long–term non–employment. This is done by estimating the probability of long–term non–employment for each individual in the sample and testing this probability against the null hypothesis that it is not greater than the long–term non–employment ratio in the sample (8.85 percent). Individuals with a signifi-cantly higher long–term non–employment probability are defined as belonging to the group of hard–to-employ. Given rather brief average spells of non–employment this criterion is fairly extreme and leaves us with 74 observations within the sub-sample of the hard–to-employ. However. our main conclusions remain valid for less extreme selection procedures (e.g. choosing the hard–to-employ on the basis of a six month criterion).

The descriptive statistics of the subsample of outsiders are given in table 15. In comparison to the overall sample the outsiders are slightly younger (19 years vs 22 years). and have almost the same general educational background. The most distinguishing feature is the background with respect to vocational training. While in the overall sample 70 percent of the youths are trained within the dual system only 3 percent of the hard–to-employ have received such a training. We interpret this result as striking evidence for the efficiency of the dual system to promote access to the labor market.

Again. the importance of the family background is striking. In the group of hard–to-employ there are on average substantially more youths whose parents have a bad general educational background (36 percent vs 20 percent). A similiar pattern is observable with respect to the occupational background of the parent. Contrary to the inferences based on the parameter estimates our selection proce-dures points out that females (65 percent vs 44 percent) and foreign youths (35

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[20]See Wurzel (1993). chapter 7. and Hunt (1995) for a more elaborate analysis of unemploy-ment compensation scheme on the hazard rate using samples of youth and adult unemployment.

Table 15: Descriptive Statistics of the hard--to--employ

	mean hard–to-employ	mean overall sample
Socio Economic Background		
AGE	19.22	21.66
SEX	0.65	0.45
NATIONALITY	0.35	0.19
FAMILY STATUS (married)	0.03	0.12
HANDICAPPED	0.20	0.13
General Educational Background		
NO CERTIFICATE[a]	0.15	0.08
LOWER SECONDARY, SECONDARY SCHOOL	0.84	0.79
ENT. FOR ADV. COLLEGES, GYMNASIUM	0.01	0.13
Type of Vocational Training		
SPECIAL VOC. SCHOOL	0.94	0.12
APPRENTICESHIP	0.03	0.72
HIGHER VOCATIONAL SCHOOL	0.00	0.07
VOC. SCHOOL: CIVIL SERVICE	0.00	0.03
OTHER VOC. TRAINING incl. HEALTHCARE	0.03	0.06
Socio Economic Background of the Head of the Household		
HOUSEHOLD HEAD NOT MISSING	0.97	0.82
AGE	49.25	50.83
SEX	0.12	0.09
FAMILY STATUS (not married)	0.09	0.11
General Educational Background of the Head of the Household		
NO CERTIFICATE[a]	0.33	0.12
LOWER SECONDARY, SECONDARY SCHOOL	0.60	0.57
ENT. FOR ADV. COLLEGES. GYMNASIUM	0.04	0.13
Voc. Background of the Head of the Household		
NON–EMPLOYED	0.20	0.15
BLUE COLLAR W. WITHOUT FORMAL TRAINING	0.34	0.18
BLUE COLLAR W. WITH FORMAL TRAINING	0.20	0.13
FOREMAN, SENIOR CRAFTSMAN	0.03	0.06
WHITE COLLAR W. WITH LOW TRAINING	0.04	0.11
WHITE COLLAR W. WITH HIGH TRAINING	0.01	0.05
CIVIL SERVANT	0.11	0.06
SELF–EMPLOYED	0.05	0.08
REPLACEMENT RATIO	0.04	0.30
number of individuals	74	1071

[a] Contains very few persons who obtained instruction at some other schools not included in the following categories.

percent vs 19 percent) are overrepresented in the group of outsiders. Of course, the results based on our selection procedure should not be interpreted in a causal manner. The fact that we find females overrepresented in the subgroup of hard–to–employ reflects to some extent the reality of their occupational choices (e.g. vocational training outside the dual system).

It seems worth mentioning that our selection procedure also reveals the "hotel mom syndrome". Youths with a high probability of long–term non–employment have on average older parents (49 years vs 42 years) and are less likely to live with a household head that is not married (9 percent vs 11 percent).

Table 20 of appendix B contains the parameter estimates of the grouped duration model where we use the duration of unemployment as the dependent variable. The sign pattern of the parameter estimates are very similar to the one for the duration of non–employment, leading to the conclusion that both dependent variables capture a similiar phenomenon. However, two distinctive features are present. Firstly, while the duration of non–employment decreases significantly with age there is no significant evidence that older unemployed youths are easier to employ. The higher probability of non–employment for the younger turns out to be the result of lower opportunity costs of time. Secondly, being trained in a profession related to the civil service almost guarantees a sure workplace afterwards when the youth is willing to delay her/his entrance into the labor market.

4 Permanent Scars or Temporary Blemishes?

Contrary to US literature (e.g. Ellwood (1982), Lynch (1985, 1989)) there has been little research on the long-run effects of youth unemployment in Germany. The vast majority of studies for Germany such as Flaig et al. (1993) or Mühleisen and Zimmermann (1993) concentrate on the effects of previous unemployment on the probability of unemployment by controlling for occurrence dependence or some type of duration dependence. None of these studies center around youth unemployment in particular. To our knowledge no study has been devoted to the long-run effects of youth unemployment on earnings. The following study attempts to gain some insight into the quantitative importance of the long-term effects of a failure during the apprenticeship and the effects of an initial unemployment on an individual's earnings in subsequent years.

The following analysis is based on a cross-section conducted in 1991/92 by the Federal Office of Vocational Training ("Bundesinstitut für Berufsbildung", BiBB) in cooperation with the Institute for Employment Research ("Institut für Arbeits- und Berufsbildung", IAB). The data set contains information on roughly 34.000 East and West German employees. For the purposes of our study the BiBB data are of particular interest since they include extensive retrospective information on the individual's labor force history. Questions about the vocational training, in particular those related to the apprenticeship training are covered in great detail. We restrict the analysis to regularly employed West German employees who were not older than 25 years when they passed their vocational training in the period 1965-1990. Hence the oldest individuals in our sample are in their fifties and can look back on a work history of more than twenty years. Contrary to the

Table 16: Earnings Distribution of Former Apprenticeship Trainees

| income (1000 DM) | (1) apprentice- ship training not completed | | (2) apprenticeship training completed and immediately followed by ... | | (3) | | (4) | | (5) | |
| | | | un- employment | | inadequate occupation outside training firm | | adequate occupation outside training firm | | adequate occupation inside training firm | |
	abs.	(%)	abs	(%)	abs	(%)	abs	(%)	abs	(%)
< 4	60	(52.6)	59	(49.2)	70	(35.4)	115	(26.5)	704	(26.5)
4–5	38	(33.3)	42	(35.0)	86	(43.4)	183	(42.2)	1148	(43.1)
> 5	16	(14.1)	19	(15.8)	42	(21.2)	136	(31.3)	810	(30.4)
Σ	114		120		198		434		2662	

NOTE: Monthly gross earnings in 1,000 DM for a sample of 3,871 West German males employed in 1991 with at least 30 hours a week who passed (or failed) an apprenticeship training in the period 1965–1990.
Source: Bundesinstitut für Berufsbildung;calculations by the authors.

studies by Ellwood (1982) for the US and Ackum (1991) for Sweden we are able to trace the long-run effects on earnings of an early failure in the labor market. The final sample used for the analysis consists of 6,970 males and 2,221 females. The reader is referred to Appendix C for a more detailed description of the sample construction and some basic descriptive statistics.

Table 16 compares the distribution of monthly gross earnings of those persons who faced problems in the beginning of their career with those who successfully completed the apprenticeship and entered the labor market without any friction. About 5.2 per cent of all persons either dropped out of the training program or became unemployed after the apprenticeship. Every fifth youth who dropped out of the training program became unemployed afterwards.

The descriptive evidence appears to be striking. While about 50 percent of those who experienced at least one of the two types of friction in the early stage of the career are located in the lower tail of the earnings distribution (<4.000 DM), only 26 per cent of the successful labor market entrants fall into this category. Moreover, those who accept an inadequate job with respect to the previous vocational training have to face substantially lower earnings. A comparison of the figures in columns (4) and (5) reveals that there does not seem to be serious differences in earnings between those who stay with the training firm and those who get an appropriate job outside the training firm.

In order to gain empirical evidence whether entry problems into the labor market have long-run effects on the individual's earnings we estimate a conventional

earnings function augmented by explicit information on entry problems into the labor market and the background of the training firm. Since there is only information on earnings in categorical form we estimate the parameters of log-earnings function by ML-ordered probit. Since the income brackets (thresholds) are known we are able to identify the parameters of the earnings function (including the variance of the error term) completely.

Table 17 and 18 present the estimates for two different specifications of the earnings function for males and females where we try to distinguish between the hypothesis of a permanent shift in earnings due to entry problems and the hypothesis that the scar effects may be decaying with time. For the sake of brevity we do not comment on the effects of the conventional regressors which in general are comparable in size and significance to the effects found in other studies using different samples.

For workers graduating from any vocational training program gross earnings increase with the general level of education. To some extent this not only reflects the effect of a higher human capital accumulation, but also the fact that apprentices with Abitur (graduation from gymnasium) are mainly recruited by high paying sectors.[21]

In order to capture the effects of the quality of training we use sectoral and firm size dummies of the training firm. Both sets of regressors have only a quantitatively weak impact on current earnings. Due to the high proportion of those males who stayed in the training sector the sectoral dummies for the training firm and the current firm are highly correlated. We can only observe marginal differences in earnings with regard to the training sector. Similar arguments hold to the firm size dummies for the training and the current firm. However, in this case the firm size effects of the training firm are more pronounced than the effects of the current firm. Receiving a training in a large firm significantly increases the earnings prospects in later years. The well-known positive correlation between firm size and income vanishes if one controls for the size of the training firm. The opposite is true for female earnings where the firm size effect of the training firm cancels. Since for females we observe a proportion of employees not working in the job they have been trained for due to interruptions in the career we can conclude that the quality of the training firm captured by the firm size dummies vanishes.

Somewhat problematic is the inclusion of three variables capturing the effect of job mobility on earnings, since they may be affected by endogeneity. Both male and female workers can expect a positive return to changing their original profession during their career. For males earnings are increased by 8 percent if they change the profession (but not the employer) and 3 percent for the reverse. A change of the employer corresponds to an increase in current earnings of 3 percent for males while this effect is insignificant for females. The joint effect of both, a change in the profession and of the employer is captured by the sum of the two respective estimated coefficients and the one obtained from the interaction of both variables. It turns out that the joint returns are different for males and females. While males profit from a 3 percent income increase, females have to suffer a 2

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[21]For instance. Winkelmann (1996a,b) points out that 15.8 percent of all apprentices with Abitur were trained in the banking sector where the majority of apprentices (58.2 percent) graduated from Gymnasium.

Table 17: Earnings Functions for Males – ML Ordered Probit Estimates with Known Thresholds[a]

	(1)		(2)	
	Coeff.	t-value[b]	Coeff.	t-value[b]
INTERCEPT	7.75	179.8	7.75	179.6
AGE/10	0.15	8.7	0.15	8.7
POTENTIAL EXPERIENCE/10	0.14	6.8	0.14	6.8
SQUARED POTENTIAL EXPERIENCE/100	-0.05	-15.9	-0.05	-15.9
MARRIED	0.07	5.4	0.07	5.3
schooling: *(secondary school)*				
LOWER SECONDARY SCHOOL	-0.11	-12.6	-0.11	-12.6
ENT. FOR ADV. COLLEGE FOR HIGHER EDUC.	0.15	8.0	0.15	8.0
GYMNASIUM	0.19	10.4	0.19	10.4
type of failure: *(none)*				
VOCATIONAL TRAINING FAILED	-0.12	-5.1	-0.10	-1.7
...× POTENTIAL EXPERIENCE			-0.01	-0.4
UNEMPLOYMENT AFTER VOC. GRADUATION	-0.01	-0.5	-0.02	-0.5
...× POTENTIAL EXPERIENCE			0.01	0.3
changes in employment: *(none)*				
PROFESSION CHANGED	0.08	4.2	0.08	4.2
EMPLOYER CHANGED	0.03	3.3	0.03	3.3
PROFESSION AND EMPLOYER CHANGED	-0.08	-3.8	-0.07	-3.8
size of training firm: *(< 10 employees)*				
10-49 EMPLOYEES	0.03	3.2	0.03	3.2
50-99 EMPLOYEES	0.04	3.3	0.04	3.3
100-499 EMPLOYEES	0.06	5.5	0.06	5.5
≥ 500 EMPLOYEES	0.09	7.4	0.09	7.4
size of current firm: *(< 10 employees)*				
10-49 EMPLOYEES	-0.02	-2.0	-0.02	-2.0
50-99 EMPLOYEES	-0.01	-0.8	-0.01	-0.8
100-499 EMPLOYEES	-0.02	-1.5	-0.02	-1.5
≥ 500 EMPLOYEES	0.01	0.8	0.01	0.8
sector of training firm: *(service)*				
MANUFACTURING	-0.02	-2.0	-0.02	-2.0
CRAFT	-0.01	-1.2	-0.01	-1.2
TRADE	0.02	1.1	0.02	1.1
sector of current firm: *(service)*				
MANUFACTURING	0.08	8.8	0.08	8.8
CRAFT	0.03	3.0	0.03	3.0
TRADE	0.06	4.4	0.06	4.4
σ	0.26	62.0	0.26	62.0
observations	6970		6970	
log-likelihood	-14775.01		-14774.87	
	χ^2	p-value	χ^2	p-value
joint significance of slope coefficients	2015.76	0.0	2047.97	0.0

[a] Reference categories in brackets.

[b] Robust t-values based on the sandwich form of the variance covariance estimates.

Table 18: Earnings Functions for Females – ML Ordered Probit Estimates with Known Thresholds[a]

	(1)		(2)	
	Coeff.	t-value[b]	Coeff.	t-value[b]
INTERCEPT	7.66	86.7	7.66	86.7
AGE/10	0.14	3.3	0.14	3.3
POTENTIAL EXPERIENCE/10	0.06	1.4	0.06	1.4
SQUARED POTENTIAL EXPERIENCE/100	-0.04	-5.2	-0.04	-5.2
MARRIED	0.05	2.9	0.05	2.9
schooling: *(secondary school)*				
LOWER SECONDARY SCHOOL	-0.10	-5.7	-0.10	-5.7
ENT. FOR ADV. COLLEGE OF HIGHER EDUC.	0.09	2.9	0.09	2.8
GYMNASIUM	0.11	3.6	0.11	3.6
type of failure: *(none)*				
VOCATIONAL TRAINING FAILED	-0.13	-3.0	-0.09	-1.1
...× POTENTIAL EXPERIENCE			-0.02	-0.5
UNEMPLOYMENT AFTER VOC. GRADUATION	-0.03	-0.9	-0.01	-0.2
...× POTENTIAL EXPERIENCE			-0.02	-0.5
changes in employment: *(none)*				
PROFESSION CHANGED	0.11	1.9	0.10	1.8
EMPLOYER CHANGED	0.01	0.7	0.01	0.7
PROFESSION AND EMPLOYER CHANGED	-0.14	-2.4	-0.14	-2.3
size of training firm: *(< 10 employees)*				
10-49 EMPLOYEES	0.04	2.2	0.04	2.3
50-99 EMPLOYEES	-0.01	-0.2	-0.01	-0.2
100-499 EMPLOYEES	-0.01	-0.3	-0.01	-0.3
≥ 500 EMPLOYEES	0.00	0.0	0.00	0.0
size of current firm: *(< 10 employees)*				
10-49 EMPLOYEES	0.07	3.3	0.07	3.2
50-99 EMPLOYEES	0.08	2.8	0.08	2.8
100-499 EMPLOYEES	0.11	4.6	0.11	4.6
≥ 500 EMPLOYEES	0.18	7.1	0.18	7.1
sector of training firm: *(service)*				
MANUFACTURING	0.04	1.5	0.04	1.5
CRAFT	-0.02	-0.6	-0.01	-0.6
TRADE	-0.01	-0.2	0.00	-0.2
sector of current firm: *(service)*				
MANUFACTURING	-0.01	-0.5	-0.01	-0.6
CRAFT	-0.09	-2.5	-0.09	-2.5
TRADE	-0.07	-3.1	-0.07	-3.1
σ	0.31	32.6	0.31	32.6
observations	2221		2221	
log-likelihood	-4656.82		-4656.46	
	χ^2	p-value	χ^2	p-value
joint significance of slope coefficients	484.37	0.0	486.39	0.0

[a] Reference categories in brackets.

[b] Robust t-values based on the sandwich farm of the variance covariance estimates.

percent reduction. However, at least for males our results are in contrast with the common belief that a highly institutionalized German labor market punishes those who leave the professional track because of existing institutional barriers to entry into another occupation.

Most important for the purposes of our study is the final set of regressors capturing the long-run effects of entry problems into the labor market. Assuming the shift in earnings due to entry problems into the labor market is permanent, the estimates of the first specification (column (1) in table 17) imply a reduction of 12 percent (13 percent) in earnings if the youth drops out of the apprenticeship training program. Starting the professional career with a spell of unemployment does not generate a significant reduction in earnings. For the second specification we introduce interaction terms between the failure variables and the length of the work history. This allows us to check whether the effects of entry problems become less relevant over the life cycle or can be taken as permanent scars. Using the likelihood ratio test we have to reject the hypothesis of temporary blemishes in favor of a permanent reduction of earnings due to a drop out of the training program.

Since we are using cross-sectional information the usual caveats apply. In the first place we have to mention unobserved heterogeneity that cannot be controlled for. Thus both reduced earnings in later years and failure during the apprenticeship can be driven by the unobservable components such as motivation and intellectual capabilities. Therefore the size of the scar effects found may be smaller if unobserved heterogeneity is properly controlled for. Because of a different methodology and quality of data our results are not directly comparable to the earlier findings by Ellwood and Ackum. Unlike Ellwood's study we are able to focus on long-term effects that last over several decades. Moreover, we only use the incidence of youth unemployment as a predictor for earnings rather than foregone experience in terms of time out of the labor force. All in all our results suggest that the scar effects are much more severe in Germany than in the US. Our results seem to differ also from the ones obtained by Ackum for Sweden. She finds that an additional year of unemployment reduces hourly earnings only by 2 percent. Having in mind that youth unemployment spells in Germany are fairly short and the that incidence of an early failure (particularly dropping out of the training program) plays such a crucial role, our results seem to suggest that a central role of the firm specific training within the dual system is that of screening device.

5 Conclusions

The main intent of this study has been an analysis of problem groups on the youth labor market in Germany, i.e. the nature and causes of failures during the school–to–work process. Briefly, the more important findings are the following:

(i) To some extent youth unemployment is relegated to the age group 20 to 24 years because teenagers are absorbed by the apprenticeship training system. This can be seen, for example, by inspection of table 6: Leaving (lower) secondary school, roughly two thirds of all German youths are in vocational

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training one year later and only 2 percent are unemployed. But four years later, nearly 7 percent of all those youths are unemployed, whereas the majority (around 60 percent) is employed. For all figures marked differences can be observed with respect to gender and nationality. For example, foreign youths are underrepresented in the share of youths in vocational training but overrepresented in the group of employed as well as unemployed youths. Since the supply of apprenticeship training positions is subject to considerable fluctuations this role of an absorber is anything but perfect, as is evidenced by the procyclical behaviour of youth unemployment rates and a reversal of ordering between youth and adult unemployment rates at the end of the eighties.

(ii) The dynamics of youth unemployment exhibit the familiar pattern. By and large, youths face a higher risk of becoming unemployed in comparison with adult members of the labor force but their duration of unemployment is relatively short. This observation still holds if multiple spells of unemployment by the same person are taken into account.

(iii) Failures are most prominent in the following three stages in the transition process from school to work. Firstly, in 1990 about 12 percent of youths did not experience a smooth transition from schools of various types into apprenticeship training or further education and another 7 percent dropped out of the labor force at this stage for whatever reasons. Moreover, those early failures in the transition from school to apprenticeship training have long–lasting effects on the later occupational career. Secondly, in the course of apprenticeship training several sources of malfunctioning can arise such as dropping out or failing to pass examinations. More precisely, as an average figure for the eighties the number of premature terminations of training contracts as a fraction of annually signed contracts amounts to some 16 percent. The overwhelming share of all premature terminations were initiated by the trainees. With respect to examinations, roughly 10 percent fail to pass them. Around 40 percent of those who did not complete apprenticeship training enter unemployment. Thirdly, the transition from apprenticeship training, even if successfully completed, is not always smooth. During the past decades on average nearly 90 percent embarked on employment (80 percent in the same firm where they have undergone their training) but 4 percent became unemployed. The suspicion may be raised that the latter figure increased during the past years.

(iv) A more in–depth investigation of the last mentioned transition process has been carried out on the basis of an econometric hazard rate approach. More precisely, we elaborate on the duration of the first spell of non–employment (and unemployment) after the completion of formal vocational training. Our estimates are based on a proportional hazard function approach for grouped durations. The shape of the baseline hazard of a representative youth reveals that youths who do not have luck finding a job shortly after their graduation from vocational training face a comparatively long episode of non–employment. Interestingly, we do not find evidence for discrimination

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against foreign youths, perhaps due to a higher willingness of foreigners to accept less qualified jobs or a greater assimilation with German youths if their parents have been in Germany for a long time period. Similarly, there is no clear cut correspondence between gender and the probability to become employed. However, the overall background matters, i.e. the choices of the type of general education and the type of the vocational training scheme. These factors drive our findings that females and foreign nationals face high average probabilities of long–term non–employment. Previous studies on the labour market entry behavior of youths in Germany have neglected the relevance of the family background. We find an outstanding impact of family background variable on the labor market entry behavior of youths.

(v) Finally, we focus again on the question as to whether early failures represent temporary blemishes or permanent scars by estimating earnings functions on the basis of an ordered probit approach with known thresholds. While the incidence of youth unemployment does not generate a permanent scar we find that a failure in an apprenticeship training program is an important predictor of an individual's income opportunities in later stages of the working–life.

As with most empirical work a lot of questions cannot be (adequately) dealt with due to data limitations. These are of great concern, especially in this study, since we are dealing with a fairly small group of youths failing in the labor market. For example, attempts to estimate more elaborate models, such as a competing risk model for different risks of escaping from non–employment, turned out to be difficult due to, say, an overparameterization which calls for more parsimonious specifications compared with the single risk model.

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A   The GSOEP Data

Table 19: Descriptive Statistics GSOEP dataset (N=1071)

	mean	st. dev.	min	max
NON–EMPLOYMENT DURATION in Months	3.25	9.25	0.00	83.0
UNEMPLOYMENT DURATION in Months	0.81	3.23	0.00	47.0
Socio Economic Background				
AGE	21.66	2.60	17	29
SEX	0.45			
NATIONALITY	0.19			
FAMILY STATUS (married)	0.12			
HANDICAPPED	0.13			
General Educational Background				
NO CERTIFICATE[a]	0.08			
LOWER SECONDARY. SECONDARY SCHOOL	0.79			
ENTITLEMENT FOR ADV. COLLEGES. GYMNASIUM	0.13			
Type of Vocational Training				
SPECIAL VOC. SCHOOL	0.12			
APPRENTICESHIP	0.72			
HIGHER VOCATIONAL SCHOOL	0.07			
VOC. SCHOOL: CIVIL SERVICE	0.03			
OTHER VOC. TRAINING incl. HEALTHCARE	0.06			
Socio Economic Background of the Head of the Household				
HOUSEHOLD HEAD NOT MISSING	0.82			
AGE	50.83			
SEX	0.09			
FAMILY STATUS (not married)	0.11			
General Educational Background of the Head of the Household				
NO CERTIFICATE[a]	0.12			
LOWER SECONDARY. SECONDARY SCHOOL	0.57			
ENTITLEMENT FOR ADV. COLLEGES. GYMNASIUM	0.13			
Voc. Background of the Head of the Household				
NON–EMPLOYED	0.15			
BLUE COLLAR W. WITHOUT FORMAL TRAINING	0.18			
BLUE COLLAR W. WITH FORMAL TRAINING	0.13			
FOREMAN. SENIOR CRAFTSMAN	0.06			
WHITE COLLAR W. WITH LOW TRAINING	0.11			
WHITE COLLAR W. WITH HIGH TRAINING	0.05			
CIVIL SERVANT	0.06			
SELF–EMPLOYED	0.08			
REPLACEMENT RATIO	0.30	0.22		

[a] Contains very few persons who obtained instruction at some other schools not included in the following categories.

B   Regression Results for the Unemployment Model

Table 20: Parameter Estimates of the Grouped Hazard Rate Model – Dependent Variable: Duration of Unemployment[a]

Variable	Coefficient	t-value[b]
Socio Economic Background		
AGE/100	10.24	1.6
SEX	0.14	0.4
NATIONALITY	0.45	1.2
FAMILY STATUS	- 0.46	- 0.9
HANDICAPPED	0.49	1.3
General Educational Background *(No Certificate[c])*		
LOWER SECONDARY. SECONDARY SCHOOL	- 0.18	- 0.4
ENT. FOR ADV. COLLEGES. GYMNASIUM	- 1.32	- 2.0
Type of Vocational Training *(Special Voc. School)*		
APPRENTICESHIP	- 0.34	- 0.7
HIGHER VOCATIONAL SCHOOL	- 1.03	- 1.8
VOC. SCHOOL: CIVIL SERVICE	- 11.92	- 22.6
OTHER VOC. TRAINING incl. HEALTHCARE	- 0.55	- 0.9
Socio Economic Background of the Head of the Household		
HOUSEHOLD HEAD NOT MISSING	0.63	0.4
AGE	- 1.22	- 0.4
SEX	- 0.34	- 0.6
FAMILY STATUS	0.72	1.6
Voc. Background of the Head of the Household *(Non-employed)*		
BLUE COLLAR W. WITHOUT FORMAL TRAINING	- 0.96	- 2.1
BLUE COLLAR W. WITH FORMAL TRAINING	- 0.94	- 1.9
FOREMAN. SENIOR CRAFTSMAN	- 2.10	- 1.9
WHITE COLLAR W. WITH LOW TRAINING	- 0.20	- 0.5
WHITE COLLAR W. WITH HIGH TRAINING	- 0.48	- 0.7
CIVIL SERVANT	- 0.27	- 0.5
SELF–EMPLOYED	- 1.11	- 1.7
REPLACEMENT RATIO	- 0.88	- 0.6
Mean Log Likelihood	- 0.3011	
Number of Observations	1071	

[a] Reference categories in brackets.

[b] Robust t-values based on the sandwich form of the variance covariance estimates.

[c] Contains very few persons who obtained instruction at some other schools not included in the following categories.

C The BiBB/IAB Data

The earnings function estimates in section 4 are based on the cross-section interview entitled 'Acquisition and Utilization of Vocational Qualification' ("Erwerb und Verwertung beruflicher Qualifikation") which was conducted in 1991/92 by the Federal Office of Vocational Training ("Bundesinstitut für Berufsbildung", BiBB) in cooperation with the Institute for Employment Research ("Institut für Arbeits- und Berufsbildung", IAB). This data set is the third wave of a repeated cross-section study with earlier waves arised in 1979 and 1985/ 86. The third wave consists of 34,277 persons employed at the date of the interview including 10,187 former citizens of the GDR and 614 foreigners living in West Germany.

The data set contains extensive information on the complete labor force history of each individual. Questions about the vocational training, in particular those related to the apprenticeship training are covered in great detail. Monthly gross earnings which serve as a dependent variable in the proposed earnings functions are given in 15 categories, which is only a minor drawback compared to a more detailed recording. 12 categories remain after a pairwise aggregation of the 6 lowest earning classes containing only a few observations. Table 21 displays the resulting earnings distributions for males and females.

We restrict our analysis to individuals who grew up in the former West Germany because we focus on earnings impacts of failures during the transition process from apprenticeship training to employment. The East German vocational system did not offer a direct counterpart to the West German apprenticeship training. In addition, we excluded self-employed persons and part-time workers with less than 30 hours of regular weekly work. Finally, we drop individuals who completed their apprenticeship training either before 1965 or at an extraordinary high age of more than 25 years. After all, the resulting data set covers 6,970 males and 2,221 females with non-missing information.

Table 22 displays descriptive statistics of the sample underlying the analysis given in section 4.

Table 21: Earnings Distribution in the BiBB/IAB Sample

cell	earnings interval	males percentages cell	males percentages cumulated	females percentages cell	females percentages cumulated
1	< 1000 DM	0.30	0.30	1.44	1.44
2	1001 - 2000 DM	0.42	0.72	5.18	6.62
3	2001 - 3000 DM	2.34	3.06	12.83	19.45
4	3001 - 3500 DM	6.79	9.84	21.34	40.79
5	3501 - 4000 DM	13.37	23.21	20.80	61.59
6	4001 - 4500 DM	18.09	41.31	18.37	79.96
7	4501 - 5000 DM	19.21	60.52	10.09	90.05
8	5001 - 5500 DM	12.17	72.68	4.46	94.51
9	5501 - 6000 DM	9.12	81.81	2.61	97.12
10	6001 - 7000 DM	5.71	87.52	0.77	97.88
11	7001 - 8000 DM	4.03	91.55	0.77	98.65
12	> 8000 DM	8.45	100.00	1.35	100.00

Source: Bundesinstitut für Berufsbildung:calculations by the authors.

Table 22: Descriptive Statistics

	males		females	
	mean	st. dev.	mean	st. dev.
EARNINGS	7.27	2.37	5.12	1.99
AGE / 10	4.14	1.12	3.55	1.09
POTENTIAL EXPERIENCE / 10	2.21	1.17	1.61	1.14
SQUARED POTENTIAL EXPERIENCE / 100	6.26	5.40	3.88	4.57
MARRIED	0.92	0.27	0.78	0.41
schooling:				
LOWER SECONDARY SCHOOL	0.65	0.48	0.44	0.50
SECONDARY SCHOOL	0.25	0.43	0.46	0.50
ENT. FOR ADV. COLLEGES FOR HIGHER EDUC.	0.05	0.22	0.04	0.19
GYMNASIUM	0.05	0.22	0.06	0.24
vocational training:				
APPRENTICESHIP TRAINING COMPLETED	0.96	0.20	0.90	0.31
VOCATIONAL TRAINING COMPLETED	0.07	0.26	0.13	0.34
APPRENTICESHIP FAILED	0.03	0.16	0.04	0.19
UNEMPLOYMENT AFTER VOC. GRADUATION	0.03	0.18	0.04	0.21
changes in employment:				
PROFESSION CHANGED	0.35	0.48	0.26	0.44
EMPLOYER CHANGED	0.68	0.47	0.64	0.48
PROFESSION AND EMPLOYER CHANGED	0.31	0.46	0.23	0.42
size of training firm:				
<10 EMPLOYEES	0.27	0.45	0.35	0.48
10-49 EMPLOYEES	0.29	0.45	0.23	0.42
50-99 EMPLOYEES	0.10	0.30	0.10	0.30
100-499 EMPLOYEES	0.16	0.36	0.15	0.36
$\geq$ 500 EMPLOYEES	0.17	0.37	0.11	0.31
size of current firm:				
<10 EMPLOYEES	0.15	0.36	0.30	0.46
10-49 EMPLOYEES	0.24	0.43	0.22	0.42
50-99 EMPLOYEES	0.11	0.31	0.11	0.31
100-499 EMPLOYEES	0.22	0.41	0.20	0.40
$\geq$ 500 EMPLOYEES	0.28	0.45	0.17	0.37
sector of training firm:				
SERVICE	0.45	0.50	0.11	0.32
MANUFACTURING	0.29	0.45	0.20	0.40
CRAFT	0.08	0.27	0.25	0.44
TRADE	0.16	0.37	0.36	0.48
sector of current firm:				
SERVICE	0.36	0.48	0.20	0.40
MANUFACTURING	0.24	0.43	0.12	0.32
CRAFT	0.10	0.29	0.24	0.43
TRADE	0.30	0.46	0.44	0.50
observations	6970		2221	

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D   Glossary of Some Features of the German Educational System

1. *General Education*

Elementary School (Grundschule)	compulsory for all children aged six or seven years; four years schooling
Lower Secondary School (Hauptschule)	after elementary school pupils have to enroll there unless they change to higher educational schools; five years schooling; certificate of successful completion of compulsory general education (Hauptschulabchluß)
Secondary School (Realschule)	optional after elementary school; six years schooling; certificate of successful completion (Realschulabschluß) entitles enrollment in several schools of further education and, if an apprenticeship training is successfully completed, in advanced colleges of higher education (Fachhochschulen)
Gymnasium	optional after elementary school (or secondary school); nine years schooling; certificate of successful completion (Abitur) entitles enrollment at universities

2. *Vocational Education*

Elementary Vocational Year (Berufsgrundbildungsjahr)	optional part–time or full–time school after elementary school especially for those youths who do not have an apprenticeship training position; prepares for vocational education
Preparation Year for Vocational Training (Berufsvorbereitungsjahr)	optional full–time school after elementary school for youths without an apprenticeship training; prepares for vocational education (in a broader sense compared with the elementary vocational year)

Vocational School (Berufsschule)	compulsory for leavers of the lower secondary school until the age of 18; mainly three years schooling; part of the dual system in that an apprenticeship trainee has to attend this school usually one day per week during his apprenticeship training
Special Vocational School (Berufsfachschule)	provides full–time instruction lasting at least one year; does not demand vocational training or occupational experience as a prerequisite for admission; a first type enables the student to acquire a qualifying certificate in a recognized profession where attendance counts towards the training period in a recognized profession
Higher Vocational School	provides part–time or full–time instruction for those who have succesfully completed apprenticeship training and aim at a certificate of a craftsman, for example
Advanced Vocational School (Fachoberschule, Fachgymnasium)	provides full–time instruction lasting three years; these schools require certificate of secondary school for admission; Fachoberschule entitles study at a Fachhochschule, Fachgymnasium entitles study at a university
Advanced College for Higher Education (Fachhochschule)	colleges with near–university status; three years education; mostly specialized in various fields of studies e.g. engineering, commerce, social work, fine arts