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Subsidized Vocational Training: Stepping Stone or Trap? An Evaluation Study for East Germany

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**Subsidized Vocational Training:
Stepping Stone or Trap?
– An Evaluation Study for East Germany –**

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Subsidized Vocational Training: Stepping Stone or Trap? An Evaluation Study for East Germany

Abstract¹

The aim of this paper is to analyze whether the formally equal qualifications acquired during a subsidized vocational education induce equal employment opportunities compared to regular vocational training. Using replacement matching on the basis of a statistical distance function, we are able to control for selection effects resulting from different personal and profession-related characteristics, and thus, to identify an unbiased effect of the public support. Besides the ‘total effect’ of support, it is of special interest if the effect is stronger for subsidized youths in external training compared to persons in workplace-related training. The analysis is based on unique and very detailed data, the Youth Panel of the Halle Centre for Social Research (zsh).

The results show that young people who successfully completed a subsidized vocational education are disadvantaged regarding their employment opportunities even when controlling for personal and profession-related influences on the employment prospects. Besides a quantitative effect, the analysis shows that the graduates of subsidized training work in slightly worse (underqualified) and worse paid jobs than the adolescents in the reference group. The comparison of both types of subsidized vocational training, however, does not confirm the expected stronger effect for youths in external vocational education compared to workplace-related training.

Keywords: microeconomic evaluation, matching, vocational education, East Germany

JEL Classification: C14, I21, J24

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Geförderte Berufsausbildung: Sprungbrett oder Falle? – Eine Evaluationsstudie für Ostdeutschland –

Zusammenfassung

Gegenstand der Analyse ist eine Evaluation der Berufsausbildungsförderung in den Neuen Bundesländern. Es wird untersucht, ob die geförderten Jugendlichen beim Berufseinstieg gegenüber Absolventen ungeförderter Ausbildungsgänge benachteiligt sind, obwohl sie formal gleichwertige Abschlüsse erwerben. Neben dem „absoluten Effekt“ der Förderung ist von Interesse, ob sich die Effekte der beiden Arten der Ausbildungsorganisation (betriebsnahe Ausbildung und außerbetriebliche Ausbildung) voneinander unterscheiden. Durch den Einsatz von *replacement matching* auf Grundlage eines statistischen aggregierten Distanzmaßes ist es möglich, für Selektionseffekte, die aus unterschiedlich verteilten Merkmalen in den untersuchten Stichproben resultieren, zu kontrollieren. Die Datenbasis bildet das Jugendpanel des Zentrums für Sozialforschung Halle, das aufgrund seiner Fokussierung auf junge Erwachsene und seiner detaillierten Informationen für die Untersuchung besonders geeignet ist.

Die Ergebnisse zeigen, dass der Umstand der Förderung einen Einfluss auf die Beschäftigungschancen der Jugendlichen hat. So sind die geförderten Jugendlichen nach erfolgreichem Abschluss ihrer Berufsausbildung seltener erwerbstätig als vergleichbare Absolventen ungeförderter Ausbildungsgänge. Über diesen quantitativen Effekt hinaus sind geförderte Jugendliche, die eine Erwerbstätigkeit aufgenommen haben, seltener im erlernten Beruf tätig und haben ein geringeres Einkommen. Der erwartete Effekt der Organisationsform der geförderten Berufsausbildung wird nicht bestätigt – die Beschäftigungsaussichten der Absolventen außerbetrieblicher Ausbildungen unterscheiden sich weder qualitativ noch quantitativ von denen vergleichbarer Absolventen betriebsnaher Ausbildungen.

Schlagwörter: Mikroökonomische Evaluation, Matching, Berufsausbildung, Ostdeutschland

JEL-Klassifikation: C14, I21, J24

Subsidized Vocational Training: Stepping Stone or Trap? – An Evaluation Study for East Germany –

1 Introduction

Traditionally, the vocational education in Germany has been characterized by a dual system, i.e. the close cooperation between private enterprises and public vocational schools to ensure the future provision of skilled employees. While the apprentice holds an individual contract of apprenticeship with a firm for usually three years and receives the practical education within the company, the vocational schools are in turn responsible for the theoretical part of the training. The content of each professional training course (degree program) in the dual vocational education system is fixed in the Vocational Training Act (Berufsbildungsgesetz) or the German Crafts and Trades Regulation Code (Handwerksordnung). So, the content of vocational education is standardized which contributes to quality assurance. Accordingly, every person with a vocational qualification (degree) can be expected to possess certain knowledge and skills. The dual system offers advantages for both, firms and apprentices. The firms can rely on the high standard of theoretical education of their apprentices – without additional efforts and costs. Furthermore, during the practical training which takes place on the job, the firm learns more about the strengths and weaknesses of potential future employees. The advantage for apprentices: they experience practical work and 'everyday working live', and at the same time they receive the theoretical knowledge for their future profession.

Even though the system has many advantages, it induces costs and it is not always affordable, especially for small firms. Furthermore, small firms are not always able to provide all aspects of the statutory practical training program. In this context, firms and politicians debate the introduction of a training levy to be imposed on firms that do not offer apprenticeships sufficiently. This could in return release those firms that engage in vocational training. For a long time, the federal government has been introducing various programs to stimulate and to provide additional apprenticeships, especially in East Germany.² However, predominately small firms that cannot afford regular apprenticeships search for additional or alternative forms of vocational training to capture their demand for well-trained junior staff.

² Current examples are the 'Vocational Education and Training Pact' (Nationaler Pakt für Ausbildung und Fachkräftenachwuchs) and the 'Jobstarter' program (Federal Ministry of Education and Research 2009).

In East Germany since the early 1990s exists a wide-ranging experience in creating additional places for vocational training, also beyond the regular (dual) vocational training. The breakdown of the economic system after reunification resulted in a massive shortage of jobs and apprenticeships.³ As a reaction, the government provided financial support for dual vocational education in firms, but also for a large number of subsidized apprenticeships. Fostered by this financial support, various forms of cooperation between East German firms and the local educational institutions developed since the early 1990s. The main purpose of these education networks was and still is to divide the burden associated with training among several (small) firms and to enlarge the number of training facilities. This is mainly realized by outsourcing of some practical training components from firms into vocational training centers or the replacement of training in one single firm through joint training actions, where apprentices receive their practical education in different companies. Another important aspect of the training networks is the organization of subsidized vocational education. A special feature for East Germany is the large number of training places that provide stately recognized qualifications, i.e. qualifications that are regulated in the Vocational Training Act (VTC) or the German Crafts and Trades Regulation Code (CTRC), where apprentices gain practical experiences in vocational training centres or in different firms via internships instead of one training firm.⁴ The apprentices obtain formally equal qualifications to those of the regular dual vocational education.

In recent years, these additional vocational education opportunities diminished the deficit of training places to a large extent. As a result, many adolescents in East Germany were able to acquire a professional qualification, a prerequisite for a successful entry to the labour market.⁵ Thus, subsidized training programs make an important contribution to the social integration of adolescents at the so called 'first threshold' (Steiner et al. 2004). Furthermore, the established education cooperations are seen as useful and sustainable by both, firms and education institutions (Grünert and Wiekert 2005). Their experiences could serve as a 'model' for the future organization of vocational training in Germany, especially for small firms. Cooperations and subsidized vocational training provide an opportunity to educate own junior staff at relatively low cost and thus could provide a crucial factor for the future economic and innovative performance, even under more difficult conditions induced by the upcoming demographic changes.

3 A dual vocational training system similar to the one in place today also existed in the German Democratic Republic (GDR).

4 This kind of subsidized vocational education is regulated in the Training-Position-Programs East Germany and additional state programs.

5 The importance of professional qualifications for labour market success is not only visible when looking at the persistent high unemployment rates of unskilled persons in Germany; it is also emphasized again and again in the literature (see, e.g., *Reinberg and Hummel* 2005 or *Solga* 2005).

In the public perception, however, such 'atypical' forms of vocational education are seen as a second best solution and less valuable than the regular dual vocational education. There are various reasons for this prejudice. Two of the most common reasons are the bad reputation of young people who find no regular apprenticeship and the suspicion that 'nothing useful' is taught in subsidized training courses. It is doubtful if the prejudice meets the reality. Nevertheless, the society – resp. the government – is confronted with the question whether and to what degree the 'alternative' vocational training is worth supporting it and what changes are possibly necessary.

It is the aim of this paper to answer the question whether formally equal qualifications induce equal employment opportunities in practice – i.e., if graduates from subsidized vocational education in East Germany have equal employment prospects compared to graduates from regular apprenticeships. Unlike previous studies, this question will be answered using matching methods to control for possibly occurring selection effects caused by different individual characteristics of the apprentices and the apprenticeships. Thus, it is possible to identify a pure effect of the subsidy beyond the influence of personal characteristics of the adolescents or different features of the apprenticeships.

Thereby, we make use of improved micro data. While most of the previous studies are based on the first wave of the Youth Panel of the Halle Centre for Social Research (zsh), two more waves of this survey are now available. This allows a longer observation period and an increased number of cases.

In the next section the subject of analysis is defined more precisely and hypotheses will be drafted. Subsequently, in section 3 the data base and the sample are introduced. Section 4 discusses the design of the analysis, i.e. the matching method as well as the chosen variables. The results are presented in section 5. Section 6 draws final conclusions.

2 Subject of Analysis and Hypotheses

One important criterion for assessing the quality of vocational training is the effect on subsequent employment opportunities. The results of previous studies suggest that graduates of subsidized training courses are disadvantaged with respect to their job opportunities compared to graduates of regular vocational education (Berger et al. 2007, Berger and Walden 2003, Prein 2005, Steiner et al. 2004). In the literature one can find different explanations for this negative effect, e.g., lower secondary school qualifications of the apprentices, gender-specific differences, training in 'wrong' (not market conform) professions, worse economic conditions in the relevant region, and the negative image of apprentices in subsidized training courses in the view of potential employers (see, e.g., Prein 2005).

The explanations for worse employment opportunities of graduates from subsidized vocational training in the literature can be summarized as selection effects and an image effect. On the one hand, systematic differences in employment-relevant characteristics of the graduates induce personal selection effects, and, on the other hand, support for occupations that are not demanded at the labour market induce profession-related selection effects. Additionally, the uncertainty of potential employers about the skills of subsidized youths and the negative image of apprentices in subsidized training courses may induce an effect that is called 'image effect' in the following. Related to this, another explanation for different employment prospects can be seen in the organization of the vocational training: In case of regular apprenticeships, the practical part of the vocational education is realized in one training firm that commonly offers a job to successful graduates. Subsidized apprentices, on the other hand, pass various shorter internships in changing firms, and job offers are – for various reasons – much rarer after a successful graduation (Berger et al. 2007).

In the literature, mainly the negative image of the subsidized vocational training (resp. the subsidized youth) is subject of discussion. The image effect is usually explained through the narrow target group of supported vocational training in Germany as a whole without considering the special feature of East German support programs. Therefore, it is regarded as possible that negative expectations regarding the target group of the 'traditional' German supported vocational training is transmitted to the East German adolescents in subsidized training programs. This will result in worse career prospects for people with otherwise identical characteristics, when they finish a subsidized vocational training instead of a regular training.⁶

To understand the reason for these considerations, it is helpful to have a closer look at the German vocational education system and the different support schemes (see figure 1). Within this education system, two broad sectors are distinguished: the school-based training and training within the dual vocational education system.

The dominating sector is the dual vocational training system. In 2007, approximately 70 percent of all apprentices in Germany had their training within this sector (Federal Institute for Vocational Training and Research 2009). It includes firm-internal and firm-external education of professions in conformity with VTC and CTRC. The firm-internal training covers the regular vocational training in the sense described above (practical training on the job plus theoretical education in public vocational schools). 'Firm-external education' covers all kinds of governmental supported vocational education.⁷

6 Based on the results of a company survey, *Berger et al. (2007)* state that potential employers assess subsidized apprentices far more skeptical than graduates of regular vocational training. They argue with the firm's uncertainty about the motivation and abilities of the subsidized youths in general and their skepticism about the reasons for the support.

7 Not the place where the training takes place, but the kind of financing is decisive for this classification (Federal Institute for Vocational Training and Research 2009).

In West Germany, this support is focused on physically or mentally disabled as well as disadvantaged young people and amounts to approximately 5 percent of all apprenticeships in the dual vocational education system (Federal Institute for Vocational Training and Research 2009).⁸

In East Germany, besides the support for disabled and disadvantaged young people, important additional support programs exist since the early 1990s. The so called Training-Position-Programs East Germany (Bund-Länder-Ausbildungsplatzprogramme Ost), and additional state programs focus on young people who have no regular apprenticeship at the beginning of a training year, the so-called 'market-disadvantaged adolescents'. The training programs are focused on providing professional qualifications according to VTC and CTRC in promising occupations and competitive sectors.⁹ Formally, the training for market-disadvantaged persons belongs to the dual vocational education, but its realization is different from the regular training with respect to the practical part of the education. The subsidized vocational training in East Germany is usually organized as 'real firm-external' training and 'workplace-related' training.¹⁰ The training is characterized in both cases by a combined mediation of theoretical and practical skills. In vocational schools the apprentices receive the theoretical knowledge of their future profession – just like 'regular' apprentices. The practical skills are taught in vocational training centres in case of the external training, and (at least one half of the training) in internship firms in case of the workplace-related training (Berger 2006, p. 7).

In 2007, about one fourth of all apprentices in the East German dual vocational education system participated in firm-external training. About one half of them were in programs for disadvantaged youths according to the Social Security Code II and III, and about 40 percent were supported by specific East German programs (Federal Institute for Vocational Training and Research 2009). These figures show that the supported vocational education still plays an important role in East Germany. But they also suggest that it is not easy to distinguish between 'disadvantaged' and 'market-disadvantaged' adolescents in practice: In regions with a difficult labour and training market situation, the definition of 'disadvantaged youth' is less precise (Federal Institute for Vocational Training and Research 2009). So it is possible that some 'market-disadvantaged' persons are supported through programs for 'disadvantaged' persons. This could be an explanation for the image effect described above: Potential employers are possibly unable

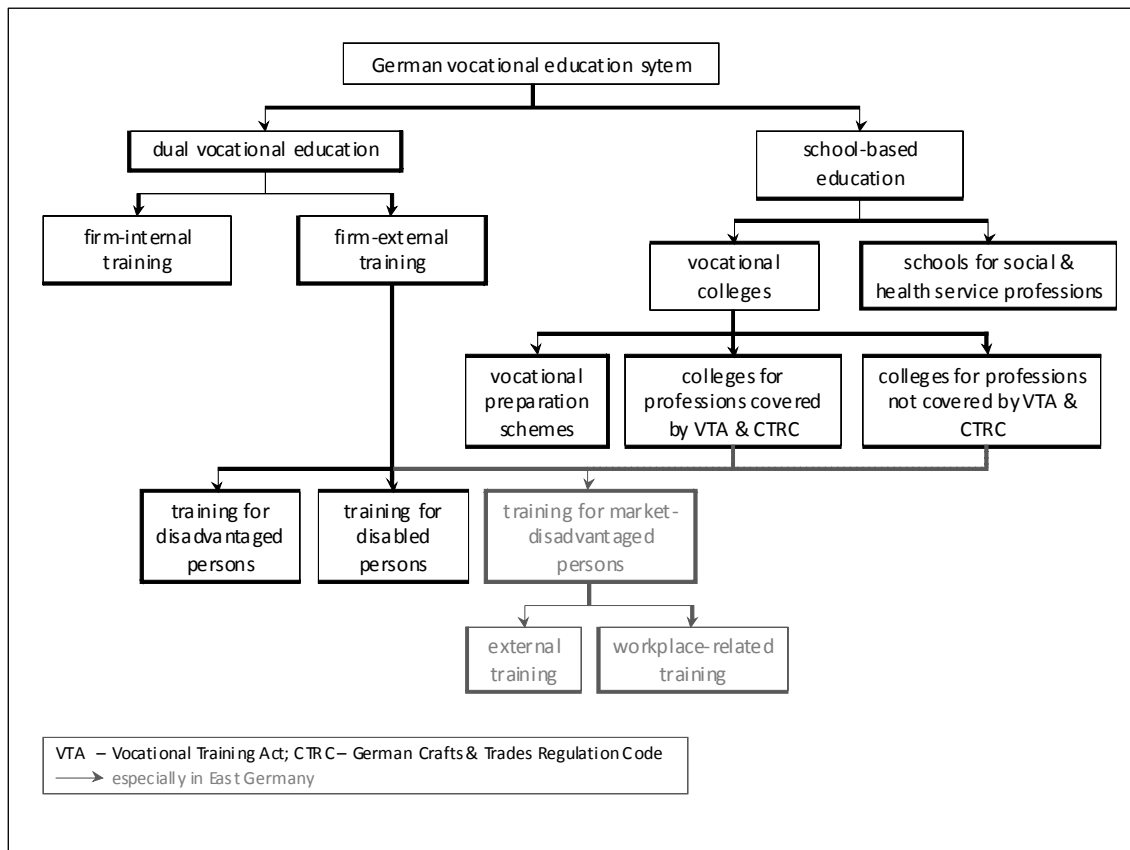
⁸ The vocational education support is regulated in the Social Security Code (SGB) II and III and is mainly organized by the Federal Employment Agency. Adolescents with educational deficits (mainly young people with immigrant background, from educationally disadvantaged families, and without school-leaving qualification), who did not find a regular apprenticeship, are regarded as disadvantaged young people (Federal Ministry of Education and Research 2009).

⁹ This is an integral part of the annual agreements between federal and state governments regarding the Training-Position-Programs. In exceptional cases, however, it is possible to receive governmental support for school-based training (see, e.g., Federal Ministry of Education and Research 2008b).

¹⁰ In the following, this real firm-external training is denoted as 'external training'.

to recognize, whether an applicant who completed a subsidized apprenticeship is 'disadvantaged' or simply could not find a regular apprenticeship.

Figure 1:
The German vocational education system



Source: Federal Ministry of Education and Research (2008a), author's depiction.

The school-based training, covering about 30 percent of the apprenticeships, includes education in vocational colleges (about 80 percent) and in schools for social and health service professions (about 20 percent). More than half of the adolescents in vocational colleges complete an occupational training, but also a number of preparatory vocational courses are provided, also supported by the government within the framework of subsidies for disabled and disadvantaged persons.¹¹ In some colleges, professional qualifications covered by VTC and CTRC, e.g. bank clerk or electrician, are provided (about 15 percent). The majority of vocational colleges, however, offer additional professions not regulated in VTA or CTRC, but subject to state laws, e.g. physical therapist or social worker (Federal Institute for Vocational Training and Research 2009).

¹¹ The most common preparatory schemes in Germany are the school-based pre-vocational training year (Berufsvorbereitungsjahr) and the basic vocational training year (Berufsprüfungsjahr).

The present study analyzes the employment prospects of graduates of subsidized apprenticeships in East Germany. The research question in the first step is, whether the employment opportunities of young graduates of subsidized apprenticeships would be better if they had finished training without government support. In the second step, considerations regarding the organization of training programs are included. Here, both kinds of subsidized vocational training, external and workplace-related training, are compared to each other. We pose the following two hypotheses to be tested empirically:

Hypothesis 1: After finishing a subsidized apprenticeship, the opportunities to find qualification adequate employment are worse compared to regular apprenticeships.

Hypothesis 2: The negative effect of support is stronger in external vocational education than in workplace-related training.

These hypotheses are drawn from different considerations. Following the results of previous studies, the observed worse employment prospects of subsidized adolescents are mainly explained by personal and occupation-related selection effects and the negative image of subsidized persons in the eyes potential employers. Using matching techniques in the present analysis, we are able to control for the selection effects mentioned above, and thus, to identify an unbiased effect of the support. In the literature, this effect is mainly associated with an image effect. But besides the image effect, the organization of the training programs can influence the graduates' future employment opportunities. The practical education in particular fulfills two functions: on the one hand, apprentices get familiar with the every-day working life; on the other hand, a potential employer has the opportunity to get to know an apprentice and to decide whether or not he wants to employ this person in the future. While in case of regular apprenticeships the entire practical education is realized in one training firm, subsidized apprentices have not much time to convince potential employers of their personal skills and abilities, because they pass only shorter internships in changing firms. This disadvantage due to the shorter contact to firms is expected to be the stronger, the less time an apprentice spends in firms.

3 Data Base and Sample

The empirical verification of the mentioned hypotheses is based on a survey of the Halle Centre for Social Research (zsh) that was conducted in the period 2002 to 2006, the so-called Youth Panel.¹²

¹² The panel was created within a research project on the labour market mobility of young people in East Germany. For more information about the project and the Youth Panel see *Zentrum für Sozialforschung Halle* (zsh) (2003).

3.1 The Youth Panel

For the panel young people born in the period between 1980 and 1985 with main domicile in East Germany (excluding Berlin) were interviewed at 3 different points in time: the persons born between 1980 and 1983 in the years 2002, 2003 and 2004, the ‘younger youths’ born in 1984 and 1985 in 2003, 2004 and 2006. Thus, the interviewed persons were at least 17 years old at the first time of the survey. The survey covers the period from 1995 to 2004 or 2006, respectively. From the young East Germans, demographic information such as year of birth, gender, citizenship, residence, household membership and information on own children are collected. The data on education include the type of school attended, the highest school-leaving qualification, but also the final grade and the school-leaving date.

The education and employment biography after leaving the general school is the main content of the survey. All training and employment periods following the school, acquired qualifications and possible additional qualifications as well as further information on apprenticeships and employment periods, i.e. the profession, the economic sector and size of the firms, are documented.¹³ Additionally, data on the monthly net income, the kind of possible governmental support and an assessment of various aspects of the apprenticeship or employment by the interviewees are given. Information on how the apprenticeship or employment has been found and who possibly supported the search are available, too.

Each of the three waves contains changing, additional information on special topics (social networks and mobility, financial aspects, leisure activities and expectations for the future). Since this information is not available for all young people surveyed, they cannot be considered in the analysis. Overall, information on 32,254 labour market spells of 10,665 interviewed young East Germans are available for the analysis of the effects of subsidized vocational education.

Because of its extensive and detailed information the Youth Panel allows to consider a large number of relevant influences on the employment prospects of young people. Additionally, the focus on one specific group of persons makes it the best available data base for the analysis of the career entry of adolescents.

3.2 The Sample

From the data set, information about young people who completed a vocational education is used. Especially the first successfully completed vocational training is the basis

¹³ The indication of the occupations is based on the classification system of the German Federal Statistical Office from 1992. For further details see *Tillmann* (2004), p. 82.

for the analysis of employment prospects after finishing vocational training. With this restriction, 9,251 labour market spells of 3,048 young people can be analyzed.

The identification of adolescents in subsidized vocational training courses is based on information provided by the interviewed young people themselves. This identification strategy is associated with the problem of potentially under-estimating the proportion of supported vocational training in the data: Not all young people will know that their apprenticeship is supported by the government, especially in case of direct financial support for the training firm (Steiner et al. 2004).

Supported and not supported vocational education, as well as external and workplace-related training, is differentiated analogously to Prein (2005) and Steiner et al. (2004).¹⁴ The occupational information in the data is aggregated to ten fields of profession on the basis of the classification system of the Federal Statistical Office (Statistisches Bundesamt 1992). The number of completed vocational training courses is very differently distributed between the professional fields.¹⁵

The most interesting characteristics of the adolescents in the sample can be found in the following table 1, for the sample as a whole as well as for the subsamples relevant for the analysis.¹⁶

The youths in the total sample (col. 2 of Table 1) were on average 20 years old when they finished their first vocational training. The proportion of women in the sample is at 46 percent being slightly lower than the proportion of men. All young people have the German citizenship as well as their parents. Very few adolescents (3 percent) have own children. Nearly half of the young people in the total sample (44 percent) live in their own households.¹⁷

Only about 10 percent of the adolescents have the general university entrance qualification, 15 percent of them successfully completed the 9th form of the secondary school

14 The following is regarded as supported training: (1) apprenticeships, where the apprentice has got an indenture with an educational institution, (2) apprenticeships, where the interviewees have received financial support, and (3) education in vocational colleges, where governmental support was given. Of the supported training the following is deemed to be external vocational education: (1) government-supported education in vocational colleges, and (2) firm-external training where the practical part of training is not organized as internship. Other supported training is regarded as workplace-related training.

15 In the fields 'mining and mineral-extraction' and 'miscellaneous workforce' no finished training courses are found in the sample. Therefore, they are not included in the Table 1. The detailed description of the sample (Table 4 in the appendix) contains both fields of profession.

16 The detailed descriptive statistics for the sample and the subsamples is provided in Table 3 in the appendix.

17 This includes an own flat, a shared household with the partner, a flat-sharing community, as well as boarding schools.

(Hauptschule). The most common school-leaving qualification is the secondary school certificate (Realschulabschluss) that have roughly two-thirds of the persons in the sample.

By far the majority (90 percent) completed the vocational training in East Germany. An apprenticeship in the dual vocational education system is the dominating kind of education – nearly 4 out of 5 young people finished the training within this system. Only 1 out of 5 persons acquired additional qualifications during their vocational training. More than half of the adolescents (58 percent) got the apprenticeship as a result of their own efforts, about one fifth with the help of family, friends or colleagues. About one fourth of the youths consulted public agencies such as vocational guidance centres or the employment agency to find an apprenticeship.

Most of the apprentices (about 20 percent) had their training in the fields of metalworking and electrical trades.¹⁸ Further common occupational fields are organization, office and administrative professions (16 percent), goods and services agents (13 percent) as well as miscellaneous manufacture occupations (11 percent).¹⁹ Nearly one half of the youth is employed directly following the apprenticeship, about one third is unemployed.

The comparison of graduates of regular and subsidized apprenticeships (the third and fourth column of table 1) shows clear differences in some characteristics. So, the percentage of women is significantly higher in the subsample of subsidized training (55 vs. 44 percent). Also, the proportion of young people who finished 9th form of secondary school is approximately twice as high among young people in subsidized training courses. Nevertheless, the secondary school certificate is the most common school-leaving qualification in this subsample (67 percent).

Discrepancies can also be observed with regard to the sector of vocational education: About three quarters of the adolescents in regular apprenticeships completed their education within the dual vocational training system, for the persons in subsidized apprenticeships this applies to about two thirds.

¹⁸ These fields include e.g. mechanical engineers, plant manufacturers, vehicle builders, mechanics, lathe operators, but also toolmakers, gas installers, plumbers, dental technicians, opticians and watch makers.

¹⁹ Accountants, commercial clerks, tax and administration experts, office administrators, secretaries, cashiers, and also managers and computer scientists belong to the field of organization, office and administrative professions.

The professional field of goods and services agents includes e.g. bank clerks, insurance specialists, wholesale and retail salespersons, specialized shop assistants and gas station attendants.

The field miscellaneous manufacture occupations covers very different professions, e.g. paper manufacturing and wood processing professions, chemists and related professions, occupations in the textile and clothing sector, craft professions like stonemasons, sculptors, potters, glassblowers, painters, printers, and food processing occupations such as bakers, butchers, cooks.

Table 1:
Characteristics of the adolescents in the sample of graduates of vocational education

Characteristics	total sample	regular apps. ^a	subsidized apps. ^a		
			total	workplace-rel.	external
number of persons	3,048	2,556	492	324	167
<i>socioeconomic factors</i>					
age	19.96	20.00	19.73	19.67	19.85
female	0.46	0.44	0.55	0.60	0.46
German citizenship	1.00	1.00	1.00	1.00	1.00
parents German citizenship	1.00	1.00	1.00	1.00	1.00
own children	0.03	0.03	0.02	0.02	0.02
own household	0.44	0.43	0.46	0.48	0.43
secondary school (9th grade)	0.15	0.12	0.27	0.24	0.33
secondary school certificate	0.76	0.77	0.67	0.71	0.59
university entrance qualification	0.09	0.10	0.03	0.03	0.04
<i>characteristics of the apprenticeship</i>					
East Germany	0.90	0.90	0.90	0.87	0.96
dual vocational education	0.78	0.79	0.68	0.68	0.68
additional qualification	0.19	0.20	0.17	0.17	0.17
app. ^a result of own effort	0.58	0.62	0.40	0.45	0.31
help of family or friends	0.20	0.21	0.17	0.20	0.13
assistance of public agencies	0.27	0.23	0.50	0.45	0.60
agriculture & forestry	0.03	0.03	0.03	0.04	0.01
metalworking & electrical trades	0.20	0.22	0.11	0.11	0.10
construction	0.08	0.09	0.07	0.04	0.13
misc. manufacture occupations	0.11	0.12	0.11	0.10	0.11
technical occupations	0.04	0.04	0.04	0.03	0.05
goods and services agents	0.13	0.13	0.15	0.17	0.11
organization, office and administration	0.16	0.16	0.16	0.14	0.20
health services	0.09	0.09	0.12	0.13	0.11
caring & educational occupations	0.05	0.05	0.06	0.07	0.04
misc. services	0.09	0.08	0.15	0.16	0.13
<i>labour market status directly following the vocational education</i>					
employment	0.46	0.50	0.26	0.27	0.23
unemployment	0.36	0.32	0.53	0.52	0.54

Notes: Information is given as proportion of youth with the mentioned characteristics; exception: age (arithmetic average).

^a app(s). – apprenticeship(s).

Source: Youth Panel of zsh, authors' calculation.

About three quarters of the young people in regular vocational training, but only 40 percent of the subsidized adolescents found their apprenticeship due to own efforts. Also the proportion of young people who experienced help through their family or friends is slightly higher in the subsample of persons in regular training courses (21 vs. 17 percent). In contrast, about half of the young people in subsidized apprenticeships were assisted by vocational guidance centres or the employment agency to find an apprenticeship, about twice as much as in the sample of regular training.

Differences in the distribution of apprenticeships in the professional fields are mainly observable in the fields of metal and electrical trades and miscellaneous services.²⁰ Within the group of trainees with regular apprenticeship, metal and electrical trades accounts for as much as 22 percent. This is a share twice as high as for the adolescents in subsidized training. The opposite is true for the field of miscellaneous services: Here, the proportion among the subsidized youth (15 percent) is about twice as high as in the sample of non-supported persons (8 percent). Also, the proportion of apprentices in health service professions is slightly higher among the young persons in subsidized training (12 vs. 9 percent).²¹

About one half of the graduates of regular vocational training is employed directly after finishing the apprenticeship, but only one fourth of the graduates from subsidized training. The proportions of persons in unemployment are one third vs. one half. This observation suggests that young people who completed a subsidized vocational education have worse career prospects than graduates of regular training.

In the last two columns of Table 1 the characteristics of the subsamples of graduates of workplace-related training (col. 5) and external training (col. 6) are reported. The persons in both subsamples differ mainly with regard to gender, school-leaving qualification and some characteristics of the apprenticeship. So, among the persons in workplace-related training the proportion of women is much higher than in external training (60 vs. 46 percent), the secondary school certificate is more common (71 vs. 59 percent) and the proportion of persons who completed the 9th form of secondary school (Hauptschule) is smaller (one fourth vs. one third). When searching an apprenticeship, own effort and help of family and friends is more frequent among adolescents in workplace-related training (45 vs. 31 percent resp. 20 vs. 13 percent), assistance of public agencies is less frequent than among youth in external training (45 vs. 60 percent).

Differences can also be observed with regard to the distribution of occupations. The proportion of persons in construction professions is significantly higher among the adolescents in external training (13 vs. 4 percent).²² The same is true for organization, office and administration occupations with 20 vs. 14 percent. Within the professional field of goods and services agents, however, workplace-related training is more common (17 vs. 11 percent).

20 The area of miscellaneous services includes professions in the hotel and catering business, hairdressers, beauticians, and occupations related to cleaning and waste management.

21 Besides doctors and pharmacists, medical- technical assistants, nurses and other therapeutic professions are included in this occupational field.

22 This professional field covers e.g. bricklayers, concreters, pavers, road and rail track builders as well as carpenters, roofers, plasterers, glaziers and interior decorators.

The employment opportunities after finishing training are nearly at the same low level in both types of subsidized vocational training: Only about one fourth of the adolescents are employed, whereas about one half is unemployed in both subsamples.

The descriptive analysis shows that the observed characteristics are not equally distributed over the subsamples. So, the differently distributed personal characteristics and profession-related factors in the subsamples may be an explanation for the different employment opportunities of the persons.

However, from the comparison of characteristics it is not clear, whether the fact of support itself has an impact on the employment prospects. To answer this question it is necessary to control for the personal and profession-related selection effects that result from the described characteristics differently distributed in the subsamples. In other words, an unbiased identification of the negative effect of support requires the use of appropriate evaluation methods. In the present study, matching techniques are used to find comparable adolescents for the subsidized persons and to control for selection effects.

4 Matching Method and Variables

The effect of support is expected to reduce the opportunities to find an employment adequate to the relevant qualification. To analyze this effect, the employment prospects of adolescents in subsidized vocational training are compared with the chances of their counterparts in regular training. Furthermore, the persons in both types of subsidized training (workplace-related and external) are compared to each other.²³

In the present study, matching is applied to control for selection effects due to differently distributed characteristics. Matching bases on the idea of finding 'statistical twins' for the persons in subsidized vocational training.²⁴ For each person, one or more partners from the sample of youth in regular training are assigned. The partners of all subsidized persons are summarized in a specific sub-group of adolescents in regular vocational training. As a result, the employment prospects of the adolescents in both, the sample of subsidized persons and the constructed sub-group, should be the same, if the support itself has no impact.

23 The Matching process described in the following is the same for both steps of the analysis.

24 Since the beginning of the 1990ies, matching is a very popular tool in empirical research, mainly in evaluation studies and also a field of intensive research. Some of the most influential studies are *Abadie and Imbens* (2002), *Angrist and Hahn* (2004), *Bergemann et al.* (2004), *Caliendo and Hujer* (2006), *Cochran and Rubin* (1973), *Dehejia and Wahba* (2002), *Fredriksson and Johansson* (2003), *Heckman and Hotz* (1989), *Heckman et al.* (1998), *Heckman et al.* (1999), *Imbens* (2004), *Imbens and Wooldridge* (2008), *Lechner* (1998), *Rosenbaum and Rubin* (1983).

4.1 The Matching Process

Matching is based on two basic assumptions, the Conditional Independence Assumption (CIA) and the Common Support Condition. The first one states that the potential employment prospects are equal for persons with identical observed characteristics, irrespective of graduating from subsidized or regular training.²⁵ The Common Support Condition (Sianesi 2004) or 'Overlap' (Crump et al. 2009) means that it must be possible to find persons with the observed values of the matching variables in both samples, the subsidized youth as well as the persons in regular training.

A potential problem with matching is that the search for 'statistical twins' is solely based on observable characteristics. Thus, potential heterogeneity in unobservable factors may not be removed through matching techniques. A commonly recommended solution for this drawback is to combine matching with the Difference-in-Differences approach (Smith and Todd 2005). Another solution is to construct indicators for possible relevant unobservable factors (see, e.g. Reinowski et al. 2005). Because in the present study the data base contains much detailed information on the interviewed youth, the unobservable impacts are captured by constructing indicator variables.

The compliance with the Common Support Condition in every single variable is examined for each person in both subsamples. The condition is regarded as fulfilled for one person, if at least one person in the other subsample with corresponding variable values can be found. If the condition is not met for a person, this person must be removed from the analyzed sample.²⁶

To find adequate partners for the youths in subsidized training, it is necessary to consider every relevant variable in the matching process, that is all characteristics that influence the employment prospects as well as the kind of financing scheme for the apprenticeship (subsidized vs. non-subsidized). Now, one could have the idea to examine the correspondence of every single variable. This exact matching, however, raises the potential problem of not finding partners that correspond in every variable value, particularly if many (mainly metrically scaled or polytomous nominally scaled) matching variables are considered (Black and Smith 2004). Reducing the number of considered variables is not a feasible option, because in this case the CIA is violated. Therefore, the information must be summarized in an appropriate way. A particular problem of the present study (like of empirical studies in general) is that the matching variables to be considered are differently scaled. So, a summarized measure of correspondence has to be used.²⁷

25 This assumption has various names in the literature. Besides CIA (Lechner 2001), it is referred to as 'Ignorable Treatment Assignment' (Rosenbaum and Rubin 1983) or 'Unconfoundedness' (Imbens 2004).

26 Tables 4 and 5 in the appendix contain information on the number of persons excluded.

27 The most commonly used measure in empirical studies is the Propensity Score. But in the literature it is criticized that in small samples the risk of biased treatment effect estimation is high, because

The results of a simulation study performed in advance suggest that a statistical distance function, the Mahalanobis Matching Distance, is a good solution for the problem, especially if mainly polytomous nominally scaled variables are included in the matching process. This function is proposed by Kaufmann and Pape (1996) and can shortly be described as weighted average of scale specific measures for every scale level that occurs in the matching variables. Here, metrically and nominally scaled variables are included, so the Mahalanobis Distance (Mahalanobis 1936) and the Generalized Matching Coefficient are combined. The number of variables of one scale is used as weight for the respective distance function.²⁸ Because of its superiority in comparison to other distance functions in the study mentioned, the Mahalanobis Matching Distance is used to summarize the distance information for the variables considered in the present study.

On the basis of distance information, partners for the analyzed adolescents in subsidized vocational training are found using an assignment process with replacement. In this process, the best available partner is assigned to every person, irrespective of whether the partner is already assigned to other persons or not. To assess the quality of the matching process, non-parametric tests for related samples are used in this study. Because the considered variables are differently scaled, it is not possible to use one test for all covariates. Thus, scale specific tests are applied: for metrically scaled variables the Wilcoxon sign-rank test (Büning and Trenkler 1994), for dichotomous nominal variables the McNemartest (Siegel 1997). As no test for related samples is available for polytomous nominal variables, the χ^2 -test of homogeneity (Büning and Trenkler 1994) is used. The test results can be found in tables 4 and 5 in the appendix.²⁹

4.2 The Matching Variables

In order to find adequate partners for the youth in subsidized training, all characteristics that influence the employment prospects and the kind of financing scheme for the apprenticeship (subsidized vs. non-subsidized) must be considered. The selection of these variables is based on theoretical considerations and the results of previous studies on employment prospects, particularly career opportunities for young people.³⁰

despite equal Propensity Scores the control group may consist of persons that are not 'statistical twins' of the youth in subsidized training regarding their employment perspectives (Fröhlich 2004, Zhao 2004).

- ²⁸ For a detailed description of this distance function and the simulation results, see *Dettmann (2009)*.
- ²⁹ In order to check the robustness of the Matching results, an optimal Nearest Neighbor Matching, Random Matching and an optimal full Matching are used additionally to identify the comparison group. The results of all assignment processes are compared by non-parametric tests. The comparison showed that Matching with replacement is best suited for the present data to find 'statistical twins'.
- ³⁰ Since the support of apprentices is orientated on their prospects at the labour market, all factors relevant for employment perspectives are also relevant for the financing scheme – with one exception,

Mainly socioeconomic factors, characteristics of the apprenticeship, and the general situation at the labour market are important determinants of the employment prospects. Furthermore, the labour market biography and the support of persons in the social environment must be considered when trying to explain employment opportunities.³¹

From the data, information concerning the age at completion of vocational training, gender, type of school-leaving qualification (no degree / finished secondary school (9th form)/secondary school certificate / university entrance qualification), kind of household (own household or living in parents' household) and the existence of own children are used for the matching process. The age at completion of a vocational training is expected to have a negative influence on the employment opportunities: The younger a job applicant, the higher is – ceteris paribus – his employment probability. It is also taken into account that men and women have different labour market perspectives, as is suggested e.g. by the development of gender-specific unemployment rates in the observation period.³²

In case of equal professional qualifications it is expected that a higher school-leaving qualification will have a positive impact on the employment opportunities of adolescents, since the school-leaving qualification can be interpreted as a signal for the general abilities and efforts of a potential job applicant.

The kind of household (own versus parents) can be seen as a reference for the independence of young people. In addition, the incentive to finance life through own income is presumably higher for adolescents living in their own household. Especially for young women, own children are considered to be a barrier to employment. Therefore, they are also taken into account when matching.

Information on nationality and place of birth are also available in the data, but they are not used for matching, because all adolescents in the sample have the German nationality and were born in Germany. The same applies to the citizenship of their parents.

Unfortunately, the final school grade cannot be used for matching, because this information is available only for about half of the adolescents in the sample.

the occupation-specific characteristics. Therefore, their relevance for the apprenticeship will not be separately mentioned in the following.

- 31 Referring to own studies, *Heckman et al.* (1997) emphasize that previous labour market experience is a crucial determinant of labour market choices and employment prospects of a person. The relevance of social structures and networks for the explanation of unequal employment perspectives and training decisions is stressed e.g. in *Solga* (2005).
- 32 While at the beginning of the observation period (1995), the unemployment rate for men was with approximately 9.5 percent lower than that for women (approximately 12 percent), a higher unemployment rate among men was observed in the period between 2001 and 2006. For further details see *Federal Employment Agency* (2008).

The type of vocational training, the occupation, and additional acquired qualifications are employment-relevant characteristics of the vocational education. The occupational information in the data is summarized to ten fields of profession (as described in Section 3): agriculture & forestry, metalworking & electrical trades, construction, misc. manufacture occupations, technical occupations, goods and services agents, organization, office and administration, health services, caring and educational occupations, and misc. services. The type of vocational education (dual vocational training vs. school-based training) is additionally considered for matching, since the discrimination between both sectors by means of the occupational fields is not exactly possible. Additional qualifications, acquired during vocational training can improve the employment prospects. Therefore, they are also used for matching. Information on the vocational qualification is available in the data for almost half of the persons in the sample and therefore cannot be considered for matching. The assessment of different aspects of the apprenticeship – in particular of the requirements and the burden associated with the training and the working hours – provide information on how the apprentices can cope with the demands of their chosen profession. The assessment information is therefore also included.

The place of vocational training and the date of completion are used to capture the general situation at the labour market. The training place is roughly divided into three regions: Central Germany (Saxony, Saxony-Anhalt and Thuringia), North-East Germany (Brandenburg and Mecklenburg-Vorpommern), and the West German states including Berlin.³³ The perspectives at the labour market are better in the last mentioned region than in the other two regions in East Germany.³⁴ The youth in the sample complete their apprenticeships in the period 1995 to 2006. These 12 years are classified in three periods according to the labour market conditions over time. The labour market situation in the years 1995-1998 is characterized by a rapidly increasing unemployment rate, in the years 1999-2002, it develops relatively stable at a high level and increases again slightly in the years 2002-2006.³⁵

Additionally, the data contains information whether the vocational education started immediately after school and if not, what the youth did before the start of the training. Of particular importance for employment opportunities are e.g. previously started, but not successfully completed training, possible employment and unemployment periods, and the completion of the military or civilian service. These data are also considered for matching.

33 Despite their heterogeneity, these 11 states are summarized to one region, because the proportion of adolescents who do their vocational training here (in West Germany and Berlin) is comparatively low (10 percent). See Table 1.

34 This is confirmed e.g. by the comparison of the unemployment rates in the federal states in the period 1995 to 2006 (*Federal Employment Agency* 2008).

35 Dividing the period into these three phases is based on official statistics from the *Federal Employment Agency* (2008).

The social environment of adolescents is another important aspect for the assessment of career prospects. In the literature, the influence of family background on decisions regarding school and vocational education – as a precondition of employment prospects – is explicitly emphasized.³⁶ However, the focus of the present study is less on the explanation of different educational decisions in the past, but rather on the explanation of different career opportunities – taking into account the outcome of previous educational decisions. The support that a young person receives from his environment when looking for an apprenticeship or employment is another influential factor on the success at the labour market. Therefore, a network indicator is constructed from the available data that contain both, family support as well as support of friends or colleagues.

In addition, the indicator of the adolescent's motivation and activity at the labour market summarizes information on a young person's efforts to find an apprenticeship and the initiative to acquire additional qualification during the training. It is expected, that employment opportunities of a higher motivated person are better. The network and motivation indicators – together with information on the labour market biography and the assessment of training by the apprentices – allow to control for unobservable heterogeneities regarding the adolescent's behaviour at the labour market and thus, to ensure that the selection bias is completely removed through matching.

5 Results

In the empirical analysis, two hypotheses are tested. Firstly, a negative effect of support is expected to result in worse opportunities to find a qualification adequate employment for adolescents in subsidized vocational training compared to persons in regular training. Secondly, the negative effect of support is expected to be stronger for youth in external apprenticeships compared to persons in workplace-related training.

For the analysis of the effect of supported vocational training, different criteria are used. On the one hand, the quantitative effect of the support on the proportion of young people who find a job is assessed. On the other hand, various qualitative characteristics of the started job are compared. In addition to the professional status and the income situation, particular characteristics of atypical employment, i.e. the type of contract and the regular monthly working time, are considered, since those characteristics suggest a po-

³⁶ The relationship between educational decisions of children and adolescents and their parent's educational attainment and 'way of life' (e.g. employment and occupational status or the number of books in the household) is often stressed in the literature (*von Below* 1999, *Woessmann* 2004).

tentially weaker or precarious labour market position than 'normal' working conditions, i.e. permanent full-time employment.³⁷

5.1 Comparison of Subsidized and Regular Apprenticeships

In the first step, the subsidized vocational education is evaluated by comparing the labour market success of graduates of subsidized apprenticeships and that of the control group of graduates of regular training. Figure 2 shows the share of employment in the group of subsidized versus regular apprenticeships right after education and in total (throughout the period of observation).

The comparison shows remarkable differences. Immediately after completion of the vocational training, only about one fourth of the graduates of subsidized training is employed, in the comparison group the proportion is nearly one half. The proportion of employed youths increases in both groups over time – among the subsidized young to about one half and in the comparison group of regular apprentices to about 70 percent throughout the 12 years period of observation. Both, immediately after the training as well as in the course of the observation period, the employment opportunities of young graduates of subsidized vocational training are lower than that of their counterparts with regular apprenticeships. This observation confirms the presumed effect of subsidized training, which is expected to negatively influence the employment prospects compared to that of regular training.

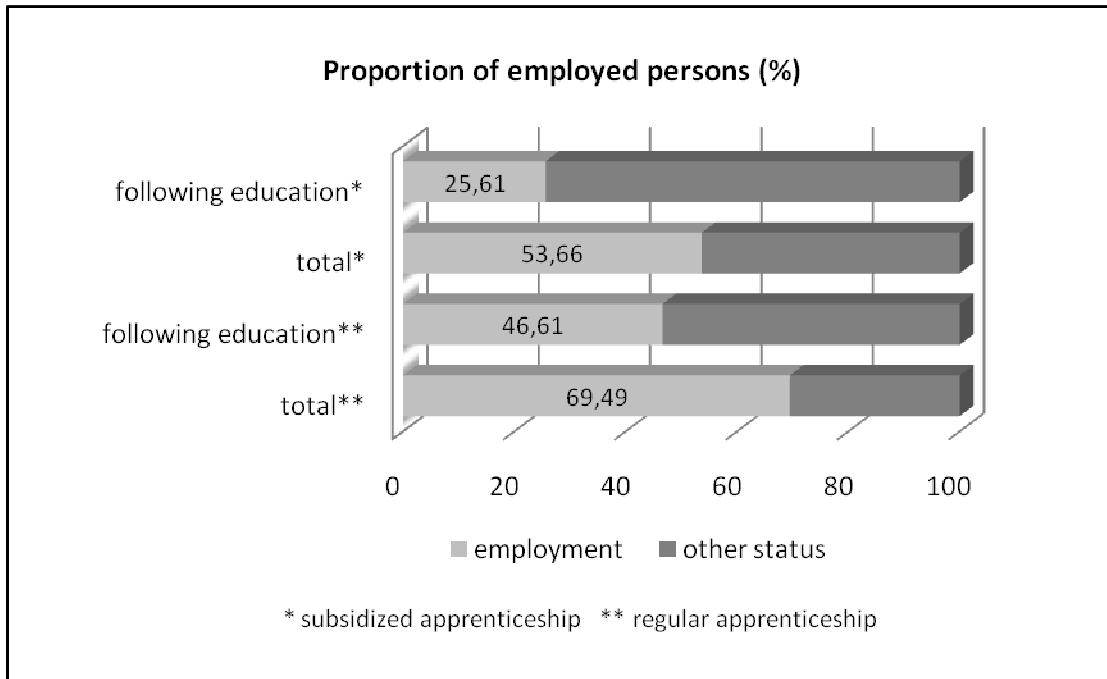
Besides the quantitative facts, employment opportunities have a qualitative dimension with respect to the job in which people start working after vocational education. Therefore, some characteristics of the first employment started after vocational training are summarized in Table 2. The information is given in absolute figures in case of the number of (employed) persons, the duration until transition to work and net income, and as percentage of the employed persons in the compared groups for the job details.

The results show that the employment prospects of graduates from subsidized apprenticeships also differ with respect to some characteristics of the started job. So, subsidized apprentices need on average 5 months for entering their first employment, approximately two months longer than comparable graduates of regular training. This can be partly explained when looking at the percentage of young people who receive a job offer of their training firms after graduation. This share is with 15 percent comparably small among the subsidized persons, whereas nearly 40 percent of their counterparts in regular apprenticeships get such an offer. Not all recipients accept this offer, but nevertheless the information suggest, that the expected advantage of regular apprenticeships regarding the organization of the practical training is a relevant component for explain-

³⁷ Based on own empirical results, *Berger et al.* (2007) state that graduates of subsidized training are more frequently employed in atypical, potentially precarious jobs.

ing the effect of support.³⁸ Furthermore, the proportion of young persons in qualification adequate jobs is much higher among the regular apprentices (85 vs. 70 percent) and their net income is on average about 90 Euro higher compared to subsidized apprentices.³⁹

Figure 2:
Share of employment– subsidized vs. regular apprenticeships



Note: Shares of employed persons are significantly different between subsidized apprentices and their counterparts (McNemartest at the 5 percent level).

Source: Youth Panel of zsh; authors' calculations.

On the contrary, no significant differences are observed regarding the kind of job. About 40 percent of the employed persons in both groups have 'normal' contracts (permanent full-time employment), about three quarters of them are employed in skilled jobs, most persons (about 85 percent) work full time, and about half of the job starters work overtime.

The observed differences in employment quantity and quality confirm the first hypothesis of the negative effect of subsidized vocational training on employment prospects

³⁸ Against the background of the image effect discussed in the literature and the much shorter contact of subsidized apprentices to firms, the 15 percent of graduates who got a job offer of their internship firms can be regarded as success, because it shows that they were able to rebut the prejudices of potential employers. But the comparison to regular apprenticeships shows that the success could have been even greater for the observed youths. In this sense, the effect of support could be interpreted as 'less positive' than that of regular training instead of 'negative'.

³⁹ Information on the net income is available for only 75 percent of the employed youths.

compared to regular vocational education. They are also consistent with the results of previous studies that find a negative quantitative employment effect of subsidized training (Prein 2005, Steiner et al. 2004). The supposed more precarious labour market position of subsidized adolescents, however, is not consistent with the data – unlike the results of Berger et al. (2007).

Table 2:
Characteristics of first employment after vocational education
– subsidized vs. regular apprenticeships –

characteristics	subsidized apprenticeship	regular apprenticeship
number of persons	492	354
number of employed persons	264	246
proportion of employed persons*	53.66	69.49
duration until employment* (months)	5.04	3.17
adequate job* (fitting the qualification)	68.37	85.40
net income* ^a (Euro)	917.66	1002.40
normal job (full-time, permanent employment)	38.72	40.17
job offer after training*	15.91	41.46
<i>kind of job</i>		
full time	84.68	82.97
part-time	13.62	14.85
marginal part-time	0.43	0.87
changing	1.28	1.31
<i>type of contract</i>		
permanent	42.98	47.14
temporary	55.32	48.90
no contract	1.28	1.76
self-employed	0.00	2.20
<i>job position</i>		
low skilled ^b	17.87	9.61
skilled ^c	72.34	77.29
higher skilled ^d	8.51	8.73
high skilled ^e	0.00	2.63
<i>working overtime</i>		
yes	48.94	50.22
no	51.06	49.78

Notes: Information is given in absolute figures or as percentage of the employed persons.

* statistical significant differences between subsidized apprentices and their counterparts;

^a information available for approx. 75 percent of the employed persons; – ^b no vocational education degree required;

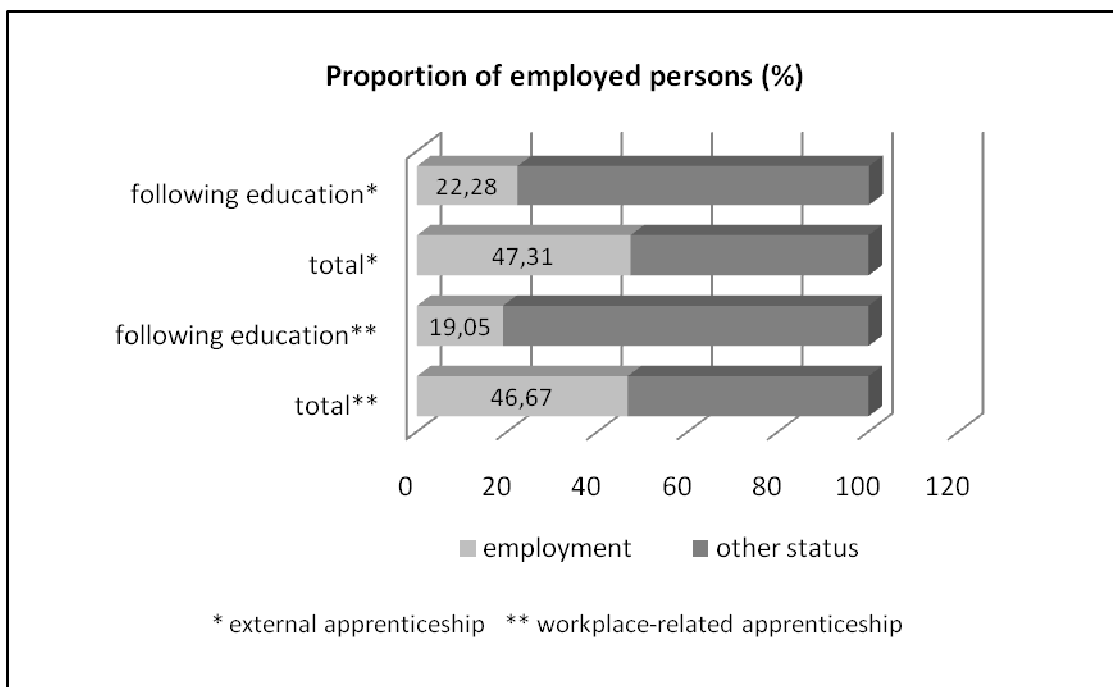
^c vocational education degree required; – ^d master craftsmen, technicians required; – ^e academic degree required;

Source: Youth Panel of zsh; authors' calculations.

5.2 Comparison of External and Workplace-related Apprenticeships

The second step of the analysis shall answer the question whether the effect of support is stronger for adolescents in external training compared to workplace-related training. This would indicate an effect of the organization of training courses; particularly it could answer the question if adolescents get a chance to show their abilities and to refute potential prejudices during a firm internship. As Figure 3 shows, the quantitative effect for graduates of external training and the effect for comparable graduates of workplace-related training is almost the same. Immediately after training, about one fifth of the adolescents in both groups are employed. Over the entire observation period, the proportion of employed persons increases to almost one half in both groups. The observed shares of employed persons are in both cases not significantly different from each other.

Figure 3:
Share of employment– external vs. workplace-related apprenticeship



Note: Shares of employed persons do not differ statistically significant between apprentices in external training and their counterparts in workplace-related training (McNemartest at the 5 percent level).

Source: Youth Panel of zsh; authors' calculations.

Also the analysis of qualitative aspects of the first employment after graduation shows no significant differences of the job characteristics between both types of subsidized

training.⁴⁰ So, the graduates in both groups need on average half a year to find their first employment. The proportion of persons employed in jobs fitting their qualification is about 60 percent, and about 45 percent of the persons in both groups work in ‘normal jobs’.

Altogether, the comparison of both types of subsidized vocational training shows no stronger effect of support for graduates of external training, neither in the quantitative nor in the qualitative dimension. So, the second hypothesis of a stronger effect of support for persons in external training compared to workplace-related training cannot be confirmed.

6 Summary and Conclusions

The subject of research in the present paper is a special feature of the East German vocational education system: Besides various types of education cooperation between firms and vocational training centres, there exists a wide range of publicly supported (subsidized) apprenticeships for so-called market-disadvantaged persons. These additional vocational education facilities diminish the deficit of training places in East Germany since the beginning of the 1990ies to a large extent, and thus, contribute to the social integration of adolescents by providing them the opportunity to acquire a professional qualification that is formally equivalent to those of regular vocational education.

This is not only an advantage for the youths, but can also be seen as a chance especially for small firms to meet their future demand for skilled employees. Their engagement in subsidized vocational training, e.g. by acting as an internship firm, can be regarded as a possibility to test potential future employees at – compared to a regular vocational training – relatively low cost. But for various reasons, such ‘atypical’ forms of education have a bad reputation in the public and among potential employers: Previous analyses of subsidized vocational education state that the employment prospects of subsidized apprentices are worse compared to that of graduates of regular vocational training.

The aim of the present paper is to analyze, whether the worse employment perspectives can be explained by real differences between the adolescents in subsidized and regular training or whether it results from an effect of the support itself – as is stated in previous studies. Using matching techniques, we are able to control for selection effects resulting from different personal and profession-related characteristics, and thus, to identify an unbiased effect of the support. Besides the ‘total effect’ of support, it is of special interest whether the organization of the practical part of the education has an influence on the

⁴⁰ The table containing the characteristics of the first employment is omitted, because no significant differences appear between the analyzed groups of persons. It can be received upon request from the authors.

strength of the effect, i.e. if the effect is stronger for subsidized youths in external training compared to persons in workplace-related training.

The analysis is based on unique, very detailed data, the Youth Panel of the Halle Centre for Social Research (zsh). A first look at these data shows that graduates from subsidized education have indeed worse chances to find adequate employment than graduates from regular vocational training. However, it becomes also clear that the persons in the subsamples of graduates from subsidized and regular apprenticeships as well as the persons in both types of subsidization differ in some employment-relevant characteristics. So, among subsidized adolescents e.g. the proportion of persons who finished the 9th form of secondary school is larger, own efforts to find an apprenticeship are more seldom and also the distribution of apprenticeships in the professional fields is slightly different from that of graduates of regular vocational training.

Beyond the different employment chances induced by differently distributed characteristics in the compared groups, it is expected that the fact of supported training itself has a negative impact on the employment opportunities of the supported youths. This effect can be reflected as a quantitative effect on the proportion of youths that find an employment after finishing the vocational education as well as a qualitative effect on the characteristics of the employment started. In the analysis, both aspects are considered.

The results show that young people who successfully completed a subsidized education are disadvantaged regarding their employment opportunities solely due to the kind of vocational education they completed. Even if personal and profession-related influences on the employment prospects are controlled for, the probability to find a qualification adequate employment is lower than for comparable graduates of regular training. Besides this quantitative effect, the comparison of employment characteristics shows that the graduates of subsidized training work in slightly worse and worse paid jobs than the adolescents in the comparison group. Another interesting result is the higher percentage of graduates of regular training who receive a job offer of their training firm after graduation compared to that of the subsidized youths. This can be regarded as a hint for the influence of the organization of the practical training: The better opportunity for firms to get to know potential future employees results in an advantage of regular apprentices regarding their employment prospects immediately after graduation.

Surprisingly, the comparison of both types of subsidized vocational training does not confirm the expected stronger effect of support for youths in external vocational education compared to workplace-related training. Thus, maybe not the contact to firms itself matters, but to spend enough time in one and the same firm to enable potential employers to decide whether or not an apprentice should be employed?

This aspect should be analysed in more detail in further research. To explicitly consider the duration of internships could provide important information on the possibility to improve the subsidized vocational education. A more efficient organization of practical

training would allow also subsidized apprentices to convince potential employers of their abilities, and to reduce common prejudices against (persons in) alternative types of education. This would not only improve the career prospects of young people, but would also open the opportunity for small firms (not only in East Germany) to maintain or even extend the vocational education of their own junior staff. Demographic changes and an increasing demand for skilled labour are likely to force firms to seriously consider all sources of qualified employees. Against this background and the relevance of human capital for economic well-being, it is even more important to overcome the existing bad image of subsidized vocational training.

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Appendix

Table 3: Detailed description of the sample of graduates of vocational education

characteristics	total sample	regular apps. ^a	subsidized apps. ^a		
			total	workplace-rel.	external
number of persons	3048	2556	492	324	167
<i>subsamples</i>					
regular app. ^a	0.84	–	0.00	–	–
subsidized app. ^a	0.16	–	1.00	–	–
workplace-related training	0.11	–	0.66	–	–
external training	0.06	–	0.34	–	–
<i>socioeconomic factors</i>					
age	19.96	20.00	19.73	19.67	19.85
male	0.54	0.56	0.45	0.40	0.54
female	0.46	0.44	0.55	0.60	0.46
born in Germany	1.00	1.00	1.00	1.00	0.99
German citizenship	1.00	1.00	1.00	1.00	1.00
parents German citizenship	1.00	1.00	1.00	1.00	1.00
own children	0.03	0.03	0.02	0.02	0.02
not own children	0.97	0.97	0.98	0.98	0.98
parent's household	0.56	0.57	0.54	0.52	0.57
own household	0.44	0.43	0.46	0.48	0.43
no school-leaving qualification	0.01	0.01	0.03	0.02	0.04
secondary school (9th form)	0.15	0.12	0.27	0.24	0.33
secondary school certificate	0.76	0.77	0.67	0.71	0.59
university entrance qualification	0.09	0.10	0.03	0.03	0.04
final grade at school ^b	2.46	2.41	2.57	2.56	2.62
<i>characteristics of the apprenticeship</i>					
dual vocational education	0.78	0.79	0.68	0.68	0.68
school-based education	0.22	0.21	0.32	0.32	0.32
additional qualification	0.19	0.20	0.17	0.17	0.17
no additional qualification	0.81	0.80	0.83	0.83	0.83
skilled worker ^b	0.44	0.44	0.43	0.43	0.44
journeyman ^b	0.13	0.15	0.10	0.09	0.14
specialized employee ^b	0.18	0.19	0.16	0.18	0.12
assistant ^b	0.13	0.13	0.11	0.10	0.12
technician ^b	0.01	0.01	0.01	0.01	0.00
other vocational degree ^b	0.11	0.07	0.19	0.20	0.16
agriculture & forestry	0.03	0.03	0.03	0.04	0.01
mining and mineral-extraction	0.00	0.00	0.00	0.00	0.00

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Table 3 continued.

characteristics	total sample	regular apps. ^a	subsidized apps. ^a		
			total	workplace-rel.	external
metalworking & electrical trades	0.20	0.22	0.11	0.11	0.10
construction	0.08	0.09	0.07	0.04	0.13
misc. manufacture occupations	0.11	0.12	0.11	0.10	0.11
technical occupations	0.04	0.04	0.04	0.03	0.05
goods and services agents	0.13	0.13	0.15	0.17	0.11
organization, office and administration	0.16	0.16	0.16	0.14	0.20
health services	0.09	0.09	0.12	0.13	0.11
caring and educational occupations	0.05	0.05	0.06	0.07	0.04
misc. services	0.09	0.08	0.15	0.16	0.13
misc. workforce	0.00	0.00	0.00	0.00	0.01
<i>economic environment</i>					
app. ^a in West Germany	0.10	0.10	0.10	0.13	0.04
app. ^a in East Germany	0.90	0.90	0.90	0.87	0.96
Brandenburg	0.13	0.13	0.12	0.13	0.10
Mecklenburg-Vorpommern	0.10	0.11	0.09	0.09	0.10
Saxony	0.30	0.29	0.34	0.35	0.32
Saxony-Anhalt	0.15	0.16	0.14	0.12	0.17
Thuringia	0.22	0.22	0.22	0.18	0.28
app. ^a completed 1995-1998	0.01	0.01	0.00	0.00	0.01
app. ^a completed 1999-2002	0.46	0.51	0.21	0.14	0.34
app. ^a completed 2003-2006	0.53	0.48	0.79	0.86	0.65
<i>individual labour market experiences before vocational training started</i>					
start immediately	0.42	0.44	0.30	0.36	0.20
military or civilian service	0.02	0.02	0.01	0.01	0.02
employment	0.01	0.01	0.00	0.00	0.00
unemployment	0.05	0.04	0.07	0.05	0.11
not finished training	0.04	0.03	0.05	0.06	0.05
<i>assessment of the apprenticeship</i>					
theoretical training (rather) good	0.87	0.86	0.90	0.90	0.92
theoretical training (rather) bad	0.13	0.14	0.10	0.10	0.08
practical training (rather) good	0.87	0.87	0.88	0.88	0.89
practical training (rather) bad	0.13	0.13	0.12	0.12	0.11
requirements (rather) high	0.71	0.71	0.69	0.73	0.63
requirements (rather) low	0.29	0.29	0.31	0.27	0.38
burden (rather) high	0.35	0.33	0.42	0.44	0.36
burden (rather) low	0.65	0.67	0.58	0.56	0.64

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Table 3 continued.

characteristics	total sample	regular apps. ^a	subsidized apps. ^a		
			total	workplace-rel.	external
<i>additional information</i>					
app. ^a result of own effort	0.58	0.62	0.40	0.45	0.31
help of family or friends	0.20	0.21	0.17	0.20	0.13
assistance of public agencies	0.27	0.23	0.50	0.45	0.60
motivation	0.60	0.64	0.42	0.47	0.33
<i>labour market status directly following the vocational education</i>					
employment	0.47	0.51	0.26	0.27	0.22
unemployment	0.35	0.31	0.53	0.52	0.56
other voc. training	0.04	0.04	0.05	0.06	0.03
subsidized employment	0.01	0.01	0.01	0.01	0.00
other status	0.13	0.12	0.15	0.14	0.19

Notes: Information is given as proportion of youth with the mentioned characteristics, exception: age (arithmetic average).

^a app(s). – apprenticeship(s);

^b information available for approx. 40 percent of the persons in the sample.

Source: Youth panel of zsh, authors' calculations.

Table 4: Assessment of the matching results – subsidized vs. regular training

characteristics	mean ^a			test ^b	
	T	NT	C	result	p-value
age	19.73	20.00	19.85	1	0.01
sex (male=1)	0.45	0.56	0.43	0	0.08
no school-leaving qualification	0.03	0.01	0.02	0	0.07
secondary school (9th form)	0.27	0.12	0.27	0	1.00
secondary school certificate	0.67	0.77	0.67	0	1.00
university entrance qualification	0.03	0.10	0.04	0	0.25
own children	0.02	0.03	0.03	0	0.40
own household	0.54	0.57	0.54	0	1.00
<i>characteristics of apprenticeship</i>					
dual vocational education	0.68	0.79	0.69	0	0.37
additional qualification	0.17	0.20	0.16	0	0.13
agriculture & forestry	0.03	0.03	0.02	0	0.48
mining and mineral-extraction	0.00	0.00	0.00	0	1.00
metalworking & electrical trades	0.11	0.22	0.11	0	1.00
construction	0.07	0.09	0.07	0	0.25
misc. manufacture occupations	0.11	0.12	0.11	0	0.68
technical occupations	0.04	0.04	0.04	0	0.81

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Table 4 continued.

characteristics	mean ^a			test ^b	
	T	NT	C	result	p-value
goods and services agents	0.15	0.13	0.14	0	0.48
organization, office and administration	0.16	0.16	0.18	0	0.29
health services	0.12	0.09	0.12	0	0.84
caring and educational occupations	0.06	0.05	0.05	0	0.65
misc. services	0.15	0.08	0.15	0	0.48
misc. workforce	0.00	0.00	0.00	0	1.00
<i>economic environment</i>					
Brandenburg	0.12	0.13	0.12	0	0.90
Mecklenburg-Vorpommern	0.09	0.11	0.11	0	0.48
Saxony	0.34	0.29	0.31	0	0.34
Saxony-Anhalt	0.14	0.16	0.15	0	0.69
Thuringia	0.22	0.22	0.22	0	0.81
apprenticeship completed 1995-1998	0.00	0.01	0.00	0	1.00
apprenticeship completed 1999-2002	0.21	0.51	0.21	0	0.37
apprenticeship completed 2003-2006	0.79	0.48	0.78	0	0.13
<i>individual labour market experiences before vocational training started</i>					
start immediately	0.30	0.44	0.30	0	0.90
military or civilian service	0.01	0.02	0.01	0	0.62
employment	0.07	0.04	0.06	0	0.07
unemployment	0.00	0.01	0.00	0	0.48
not finished training	0.05	0.03	0.04	0	0.05
<i>additional information</i>					
apprenticeship result of own effort	0.17	0.21	0.16	0	0.70
help of family or friends	0.69	0.72	0.72	0	0.42
assistance of public agencies	0.42	0.33	0.41	0	0.71
motivation	0.42	0.64	0.45	1	0.03
<i>summarized factors</i>					
school-leaving qualification	2.71	2.96	2.73	0	0.48
occupation	7.15	6.27	7.15	0	1.00
region	1.12	1.14	1.13	0	0.73
sum of squared distances					1.14
number of subsidized adolescents					492
number of controls					354
number of excluded persons					0

Notes:

^a Proportion of persons with the respective characteristics in the sample of subsidized adolescents (T), adolescents in regular vocational training (NT), and the control group (C);

^b Scale specific tests; metrical variables: Wilcoxon sign-rank test, dichotomous: McNemartest, polytomous: χ^2 -test for homogeneity; significance level: 5 percent.

Table 5: Assessment of the matching results – external vs. workplace-related training

characteristics	mean ^a			test ^b	
	T	NT	C	result	p-value
age	19.84	19.66	19.65	1	0.04
sex (male=1)	0.54	0.39	0.47	0	0.05
no school-leaving qualification	0.04	0.02	0.02	0	0.13
secondary school (9th form)	0.34	0.24	0.35	0	0.68
secondary school certificate	0.59	0.72	0.60	0	0.45
university entrance qualification	0.04	0.03	0.03	0	1.00
own children	0.02	0.02	0.02	0	0.72
own household	0.57	0.52	0.62	0	0.29
<i>characteristics of apprenticeship</i>					
dual vocational education	0.68	0.68	0.71	0	0.13
additional qualification	0.17	0.17	0.15	0	0.34
agriculture & forestry	0.01	0.04	0.04	0	0.29
mining and mineral-extraction	0.00	0.00	0.00	0	1.00
metalworking & electrical trades	0.10	0.11	0.11	0	1.00
construction	0.13	0.04	0.10	0	0.13
misc. manufacture occupations	0.11	0.11	0.12	0	1.00
technical occupations	0.05	0.03	0.02	0	0.13
goods and services agents	0.11	0.16	0.11	0	0.68
organization, office and administration	0.20	0.14	0.16	0	0.12
health services	0.11	0.13	0.11	0	0.75
caring and educational occupations	0.04	0.07	0.08	0	0.07
misc. services	0.13	0.16	0.15	0	0.50
misc. workforce	0.00	0.00	0.00	0	1.00
<i>economic environment</i>					
Brandenburg	0.10	0.13	0.11	0	1.00
Mecklenburg-Vorpommern	0.10	0.09	0.08	0	0.70
Saxony	0.32	0.34	0.41	0	0.09
Saxony-Anhalt	0.17	0.12	0.15	0	0.63
Thuringia	0.28	0.18	0.23	0	0.36
apprenticeship completed 1995-1998	0.01	0.00	0.00	0	1.00
apprenticeship completed 1999-2002	0.34	0.14	0.33	0	1.00
apprenticeship completed 2003-2006	0.66	0.86	0.67	0	0.62

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Table 5 continued.

characteristics	mean ^a			test ^b	
	T	NT	C	result	p-value
<i>individual labour market experiences before vocational training started</i>					
start immediately	0.20	0.36	0.24	0	0.28
military or civilian service	0.02	0.00	0.00	0	0.25
employment	0.10	0.04	0.05	0	0.05
unemployment	0.00	0.00	0.01	0	1.00
not finished training	0.05	0.05	0.04	0	0.68
<i>additional information</i>					
app. ^c result of own effort	0.13	0.20	0.16	0	0.36
help of family or friends	0.63	0.73	0.66	0	0.07
assistance of public agencies	0.37	0.44	0.32	0	0.23
motivation	0.34	0.47	0.38	0	0.32
<i>summarized factors</i>					
school-leaving qualification	2.62	2.75	2.65	0	0.45
occupation	6.93	7.24	7.00	0	1.00
region	1.16	1.09	1.16	0	0.63
sum of squared distances					1.33
number of adolescents in external training					167
number of controls					105
number of excluded persons					1

Notes: See table 4.