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Impact analysis of the educational guidance project “Dresdner Bildungsbahnen“

A quantitative study

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Summary

- This study uses a quasi-experimental control group approach to analyse the effectiveness of educational guidance such as that provided in the “Dresdner Bildungsbahnen” project, by examining the participants’ subsequent career trajectories.
- The guidance participants were female to a disproportionate extent, they were aged between 25 and 50 and had good skill levels. Nonetheless they were more frequently unemployed and comparatively poorly paid.
- There is a clearly positive effect for individuals who were not in employment when they started the guidance with regard to participation in further training funded as part of labour market policy. This effect presumably even underestimates the actually increased participation in further training, as further training measures that are not publicly funded are not depicted in the IEB data.
- In the short period that can be observed here, there is a slightly negative effect on the career trajectories of the guidance participants compared with the control group that did not receive guidance. However, it seems reasonable to assume here that the further training resulting from the guidance has a lock-in effect.
- A period of up to two years after the beginning of guidance is far too short to be able to assess definitively the effectiveness of educational guidance. It is very likely that returns will only emerge in the longer term.

Keywords: educational guidance; lifelong learning; further training; impact analysis

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1 Motivation and aim of the project

A multitude of analyses have examined the effects of in-firm further training for employees and of measures to promote vocational training and short-term training courses for the unemployed. In contrast, there are only very few studies that look into the effectiveness and the economic benefits of guidance for education and training. Educational guidance itself generally starts before one of the measures named above. Most of the studies show that participation in measures to promote vocational training and short-term training measures usually lead to the desired outcome of such a measure. Unfortunately, there are currently no findings available that can indicate how educational guidance provided prior to the measures may influence this outcome. Educational guidance prior to a training measure can have a positive impact on the measure, however. What is perceived as a positive influence of a training measure might therefore be a combined influence.

Dresden's adult education institution, Volkshochschule Dresden e. V., is developing an education management concept together with the municipality of Dresden. The aim of the joint project, known as "Dresdner Bildungsbahnen", is to develop and test an integral coherent education management concept that aims to offer all citizens of Dresden better opportunities for the best possible education and training. The "Local Learning" ("Lernen vor Ort") initiative of the Federal Ministry of Education and Research in collaboration with the Association of German Foundations creates the relevant framework for this. The "Dresdner Bildungsbahnen" project has been under way since April 2010. In 2010 and 2011 a total of 1029 individuals received educational guidance.

The aim of this study is to assess the effectiveness of educational guidance in the "Dresdner Bildungsbahnen" project, since effectiveness is the precondition for economic benefit. The career trajectories of the first cohorts of guidance participants can be tracked for a good two years. During this period, however, the steps addressed in the guidance have yet to be put into action. Only the initial effects can therefore be seen. Possible effects on careers (and therefore the individuals' employment prospects and earnings) often do not materialise until later (during the following five to ten years). A benefit in monetary terms can therefore only be fully quantified by examining future returns to education and training for a longer period than is currently possible.

The study is structured as follows: Section 2 discusses key findings of the three main strands of literature associated with the subject analysed here, the "impact of educational guidance". The generation of the data basis is described in Section 3. Section 4 compares information on the current employment status and the previous career trajectories of participants in the educational guidance scheme in Dresden with those of the population of Dresden as a whole. Section 5 describes the strategy pursued to assess the effectiveness of the educational guidance. The results of the impact analysis are presented in Section 6. Section 7 summarises the key findings.

2 Economic and social effects of education, the promotion of further training and educational guidance

2.1 Effects of education

From the perspective of economics and social sciences, the effects of education are generally defined as returns to education. A higher level of individual human capital generates an increase in the respective person's earnings that can be measured as described below (see for example Franz 2006, Chap. 3). In addition to having direct effects on earnings, labour-market-related returns to education can also result from the fact that a higher skill level is associated with a smaller likelihood of becoming unemployed (see Weber/Weber 2013) or that a person has additional options on the labour market, for instance different jobs or occupations.¹

Wage premiums are generally estimated using a Mincer equation

$$\ln wage = \alpha_1 S + \alpha_2 Ex + \alpha_3 Ex^2 + X\beta + \varepsilon$$

As the wage is included in log form, the parameters α measure the percentage wage premiums per year of schooling S and work experience Ex . Age is also often used as a proxy variable for work experience, as the equation *work experience = age – six years – duration of education and training* is approximately valid and the effect of work experience can be calculated with the aid of the parameters for duration of education/training and age. For the theoretical derivation of the Mincer equation, education/ training is modelled as an investment.² From the simplified perspective of the model, education and training should occur, if possible, in full-time before entering the labour market so that the investment can pay off for as long as possible. Going beyond this basic model, on the one hand education and training at a later point in time are worthwhile in economic terms if human capital “depreciates” (becomes obsolete, for example) in the course of time and the increase in work experience (on-the-job learning) is not sufficient to compensate for this deterioration (see Ben-Porath 1967, Taber/Fan/Seshadri 2014). On the other hand, training for a different occupation at a later point in time may also be of advantage if the occupation initially chosen later turned out to have been the wrong choice – and the alternatives have been weighed up better when making the new decision. In the light of uncertainty it is even advisable to postpone the decision to acquire strongly specialised human capital until after entering working life, as it is only then clear what specific knowledge is really required. The distinction between general and specific human capital is therefore important in this context (see Becker 1962, 1975). Especially in

¹ Besides the personal human capital effects inherent in the labour market that are listed above, there are further effects that are to be mentioned here only briefly. Effects of an economic nature are so-called human capital externalities, which are mainly said to be caused by knowledge spillovers. According to this, workers become more productive when they work together with highly skilled people. One person's human capital then also generates positive wage effects in other people (see Moretti 2004a, 2004b, Rosenthal and Strange 2008, Heuermann 2011). Effects that are only secondarily of economic nature or are not of economic nature at all are those concerning health, subjective satisfaction, the crime rate or democratic participation / political participation (see Gaiser/Krüger/de Rijke 2009, Gross/Jobst/Jungbauer-Gans/Schwarze 2011). These effects (in so far as they can be quantified in monetary terms) lead to the Mincer equation underestimating the macroeconomic returns; Harmon (2011) gives a value of 14-26% of the private returns as an order of magnitude.

² Investment in human capital is presented formally and discussed in detail in Franz (2006), Chap. 3.2.

the case of specific human capital there are incentives for the employer to bear investment costs. Productivity gains resulting from investment in this type of human capital are then also pocketed by the employer, however, and can generally not be observed via wages.

In numerous studies (and using different data sources) the returns to an additional year of education is estimated in Germany as a 7-10 % premium on the gross wage (see, for example, Ammermüller/Weber 2005, Saniter 2012).³ Rather lower returns are calculated for eastern Germany than for western Germany (as a rule 8-10 %). Converted into qualifications, a person with a vocational qualification would earn just under 30 % more in their first year of qualified employment than they would if they only had an intermediate school leaving certificate. Numerous studies show that a university graduate earns about 40-50 % more than a person with only an upper secondary school leaving certificate and 70-80 % more than if they had started working straight after gaining their intermediate school leaving certificate without completing any further education or training. Graduates enter employment later, however. A serious comparison of returns to education therefore also has to take the corresponding loss of income into account. Estimates that aggregate returns to education over the entire working life and therefore provide the best opportunities for comparison estimate the increase in gross lifetime earnings due to gaining a vocational qualification at € 55,000 and for a university degree at € 805,000 for eastern Germany, in each case compared to individuals with an intermediate school leaving certificate. For western Germany the returns in lifetime earnings due to gaining a vocational qualification amount to € 319,000 and those of a university degree are € 1,413,000 (see Schmillen/Stüber 2014). As these estimates report the mean returns to a certain form of education or training, they give the impression that returns to education are homogeneous. Anger/Plünnecke/Schmidt 2010 show among other things (only for western Germany) that there is a strong horizontal differentiation between different occupational fields within one and the same educational level. The mean return to education for STEM graduates and for occupations in economics and law is about 90-110 % compared with individuals with an intermediate school leaving certificate (without a vocational qualification or an upper secondary school qualification). Occupations in the health sector and in teaching and administrative academic occupations possess a rather average return of 70-80 %. In contrast, the return to education for graduates of the humanities and other academic occupations (e.g. artists) is estimated as an 50-60 % income premium compared with individuals with an intermediate school leaving certificate. The return to the latter qualifications is therefore just under half the size of that of the best paid occupational fields for graduates. It is a similar level to the return to education for a master craftsman or a technician, whose cumulated duration of education, however, is generally shorter (including the initial apprenticeship).

³ For the estimate it is important to distinguish between the impact of education and training (observable) and that of unobservable skills that are innate or acquired through socialisation. The latter type of skills may influence selection into education and training and might distort the estimate of returns to education.

Further vocational training has moved more strongly into the focus of research interest in recent years.⁴ Studies published about fifteen years ago (Pischke 2001, Goux/Maurin 2000) show for Germany (and other EU15 countries) that the wage advantages resulting from in-work further training are of a far smaller magnitude than those from initial vocational training. The existence of positive wage advantages is also frequently not statistically significant. Görnitz (2011) confirms only small, statistically insignificant wage advantages. Furthermore, the study emphasises strong selection effects associated with participation in further training.

2.2 The impact of further training in labour market policy measures

A broad spectrum of active labour market policy measures are aimed at boosting the employment prospects of the unemployed by increasing their human capital. Examining the effectiveness of these measures has been of great importance in the past ten to fifteen years; yet the results of this evaluation research are not unambiguous. In an internationally comparative meta-study, for example, Card/Kluve/Weber (2010) conclude:

“Classroom and on-the-job training programs are not particularly likely to yield positive impacts in the short-run, but yield more positive impacts after two years. Comparing across different participant groups, we find that programs for youths are less likely to yield positive impacts than untargeted programs, although in contrast to some earlier reviews we find no large or systematic differences by gender [...]. We also find that evaluations based on the duration of time in registered unemployment are more likely to show favorable short-term impacts than those based on direct labor market outcomes (i.e. employment or earnings).”

The mentioned discrepancy in the direction of the effects of training measures is also revealed in studies concerning German labour market policy, as is shown in Table A 2 in the appendix for more recent evaluation studies. A few trends can be summarised briefly here: all of the studies, which, incidentally, always focus on full-time measures for the unemployed, compare participants in measures with individuals who have not (yet) taken part in a measure and detect a poorer labour market outcome for participants in the period immediately after the measure, the so-called Ashenfelter’s dip. Participants in measures reduce their job-search activities during the measure. This generally gives the control group a head start with regard to transitions out of unemployment and into employment, which has yet to be reduced on completion of the measure. It often takes approximately two to three times as long as the duration of the measure for this lock-in effect to be cancelled out.

One pattern that is highly consistent is that effects of measures are stronger the longer the participant and control groups were unemployed prior to the start of the measure. This finding is put down to the fact that in the case of a short duration of unemployment the control

⁴ To this end, survey data have been and continue to be collected and linked with administrative data at the Institute for Employment Research (IAB), often in cooperation with universities and other institutes. Examples of this are the dataset “Further Training as a Part of Lifelong Learning” (“Berufliche Weiterbildung als Bestandteil Lebenslangen Lernens – WeLL”) (Bender et al. 2009; Schmucker und Seth 2013), “Working and Learning in a Changing World” (“Arbeiten und Lernen im Wandel - ALWA”) (Antoni et al. 2010; Antoni/Seth 2012) or Stage 8 of the “National Educational Panel Study (NEPS)” (Allmendinger et al. 2011). So far, however, hardly any findings have been delivered on the impact of further training; analyses can be expected in the next few years.

group includes a large number of people who find employment again rapidly without any assistance at all – and who would therefore not actually be considered for participation in an ALMP measure.

The robustness check conducted in Biewen/Fitzenberger/Osikominu/Paul (2014) shows that the composition of the control group is of considerable importance with regard to the direction and magnitude of the effects. For instance, whether the participants in measures are compared with individuals who :

- have not taken part in any measure in general,
- have not taken part in the measure examined,
- have taken part in a certain other measure, or whether
- the control group is only known to comprise individuals who had not yet taken part in the measure examined at the time when the treatment group was participating in the measure.

The estimated effect may also be influenced, for example, by whether the comparison is based on an equal duration of unemployment prior to the measure or on a randomly generated potential date of entry into the (counterfactual) measure.

2.3 Educational guidance, occupational guidance and career services

The quality of educational, occupational and career guidance is mainly addressed in the literature on education, clinical psychology and occupational psychology. As a rule studies in the German language deal with guidance for young people or for groups with social problems. In English-speaking countries – where career advancement is perceived as a task of the universities, which also have corresponding “placement” departments – there are also studies focusing on careers guidance for highly talented academics who have not yet entered the labour market.

A trend towards various methods of career guidance having a positive effect appears to be confirmed (Whiston/Sexton/Lasoff 1998, Whiston 2002, Whiston/Brecheisen/Stephens 2003), with the target group generally comprising younger people. What is meant by effect in this strand of literature is not the subsequent employment outcome but the change with regard to psychometric indicators used to assess satisfaction with the chosen occupation, personal appearance, self-confidence and such like. In the model developed by Weber et al. 2012, which aims to portray the quality of career guidance and to facilitate the assessment of quality, the effectiveness of the intervention in terms of improving employment prospects (besides the social inclusion of the participants, prevention of discrimination etc.) is regarded as a possible society-related quality feature whose relevance can be negotiated by the actors (see on this subject also Schiersmann/Bachmann/Dauner/Weber 2008). Quantitative studies for Germany have so far also concentrated on career entry and on guidance during the vocational training phase (Boockmann et al. 2013).

Explicitly on the subject of guidance for further training, and with recourse to studies by the GIB (2008) and by Messer/Wolter (2009), Walter (2009) argues that this has less of an activating effect and more of an informative effect. What consequences this has for the future

labour market outcomes of those receiving guidance is not clear. If the best alternative of all those available is identified, selected and then also pursued, this prevents bad investments, raises potential earnings and reduces the risk of unemployment. However, no returns are to be expected if the further training activity is not increased, i.e. no additional investment in human capital is made.

The impact of guidance for further training may also be influenced by the fact that this is usually understood as guidance for individuals outside their firm or outside their occupational context (Walter 2009). Yet a considerable part of further training activity takes place within the firm or at least with some relation to the employer as regards content, and may involve some form of informal guidance (either planned as human resources development by superiors or relevant representatives, or unplanned also by colleagues).

To sum up, it can be ascertained that a longer duration of education and training tends to yield positive returns for the career. In the field of further training, however, difficulties arise when attempting to quantify this with statistical significance. Especially in the field of training-oriented labour market policy measures for the unemployed, positive effects only emerge in the long term, while in the short term the existence of negative lock-in effects is almost always verified. There is hardly any evidence regarding the impact of educational guidance to date. In this respect it is only possible to examine the impact of “educational guidance in the Dresdner Bildungsbahnen project“ compared with those people who did not participate in the “Dresdner Bildungsbahnen” project (but who were exposed to the “usual combination of formal and informal educational guidance). For more in-depth analyses it would be necessary to have more precise information about alternative guidance services available.

3 Data basis

For the impact analysis of the “Dresdner Bildungsbahnen” project, three different datasets were linked. The data basis generated in this way makes it possible to observe the participants in the “Dresdner Bildungsbahnen” project from 2003 to 2012 in an extensive context before and after participation.

3.1 Data sources

3.1.1 Integrated Employment Biographies of the IAB – extract for Dresden

The Integrated Employment Biographies (Integrierte Erwerbsbiographien - IEB) constitute the central database of the Institute for Employment Research (IAB), in which various administrative data of the Federal Employment Agency (Bundesagentur für Arbeit - BA) are merged at individual level, processed and filed long-term for scientific purposes. The IEB V11.00.00 used here, which was compiled in late 2013, contains information from

- the Employee History File (Beschäftigtenhistorik - BeH), which portrays the information from the social security notifications submitted by employers,
- the Benefit Recipient History File (Leistungsempfängerhistorik - LeH), which covers benefit recipient data from the field of Social Code Book III (SGB III), i.e. from the employment agencies,

- the Unemployment Benefit II Recipient History (Leistungshistorik Grundsicherung - LHG), in which information is gathered about recipients of benefits in accordance with Social Code Book II (SGB II) (from the joint institutions (Gemeinsamen Einrichtungen) and the local authorities authorised to implement SGB II),
- the Jobseeker History (Arbeitssuchendenhistorik - ASU), which takes data from the software for providing job-search assistance which is used by the employment agencies and the joint institutions and from a corresponding file that records similar information from the authorised local authorities via the notification procedure XSozial (the so-called XASU), and
- the Participants-in-Measures History File (Maßnahmeteilnehmerhistorik - MTH), in which participation in measures of active labour market policy is recorded.

A more detailed description of the IEB (in an earlier version) can be found in Berge/Burghardt/Trenkle (2013), the documentation of a sample of the IEB.

The data are restricted to individuals whose main place of residence was Dresden on at least one day between 1 January 2010 and 31 December 2011 and for whom there is a record in the IEB during that time – individuals who were therefore either seeking work via the Federal Employment Agency or who were in receipt of benefits in accordance with Social Code Book II or III, or for whom an employer had paid social security contributions. The entire biographies recorded in the IEB for these individuals from 1 January 2003 until 31 December 2012 are then used to calculate various variables. Although the IEB is probably the most comprehensive source of data on a person's employment biography in Germany, certain information, some of which is also relevant for evaluating the "Dresdner Bildungsbahnen" project, is not included. For example, individuals in school-based training or higher education are not recorded – options which are by all means possible following educational guidance. However, these individuals generally reappear in the data after completing this type of education or training. Furthermore, there are no details about people who are self-employed, civil servants or unpaid family workers, as these groups do not pay statutory social security contributions.

3.1.2 KES data

Information about participation in educational guidance is collected by the Volkshochschule Dresden and stored in the KES software, which was developed and made available by the office for the coordination and evaluation of publicly funded educational guidance offices in the Federal state of Berlin ("Koordinierungs- und EvaluierungsStelle für öffentlich finanzierte Weiterbildungsberatungsstellen im Land Berlin"). The KES data serve to support the educational guidance by means of information technology. The information describes the person's current situation, their present educational status and their motivation, and record funding possibilities for education and training (entitlement to a training bonus or a training voucher) etc. For statistical purposes (and to classify the individuals), the date of birth, gender and the district of the place of residence are recorded in addition to the first name and surname.

During the period from April 2010 to December 2011 1036 "initial guidance interviews" were conducted with 1029 different individuals. Ten of these individuals had their main place of residence outside Saxony, just under 70 came from other places in Saxony (mainly from the

area around Dresden) and about 30 individuals did not report their place of residence. Consequently some 920 guidance participants reported one of Dresden's districts as their main place of residence; they constitute the group of people to be linked with the IEB extract for Dresden.

Four of the people who received guidance were under 15 years old and seven were over the age of 65; the majority of the participants were therefore of working age. There were also other guidance schemes available during the observation period which were better tailored to the needs of school-leavers and young adults. For that reason the age group up to the age of 26 only belong to the target group of the "Dresdner Bildungsbahnen" to a limited degree.

3.1.3 Address data of the statistics department of the Federal Employment Agency

In the IEB the personal information (name, address, social security number) contained in the IT procedures of the Federal Employment Agency (Bundesagentur für Arbeit – BA) is replaced by an artificial individual ID, which permits a (virtually) unambiguous allocation of various data records to the same person but without revealing the person's identity. In order to identify the individuals who received educational guidance in the context of the "Dresdner Bildungsbahnen" project in the IEB a third file is required which contains the key for converting the name and address to the IEB-specific individual ID: the address data of the BA statistics department (data as of 12/2013). Here only an extract with the IEB individual IDs that can also be found in the IEB extract described above is used.

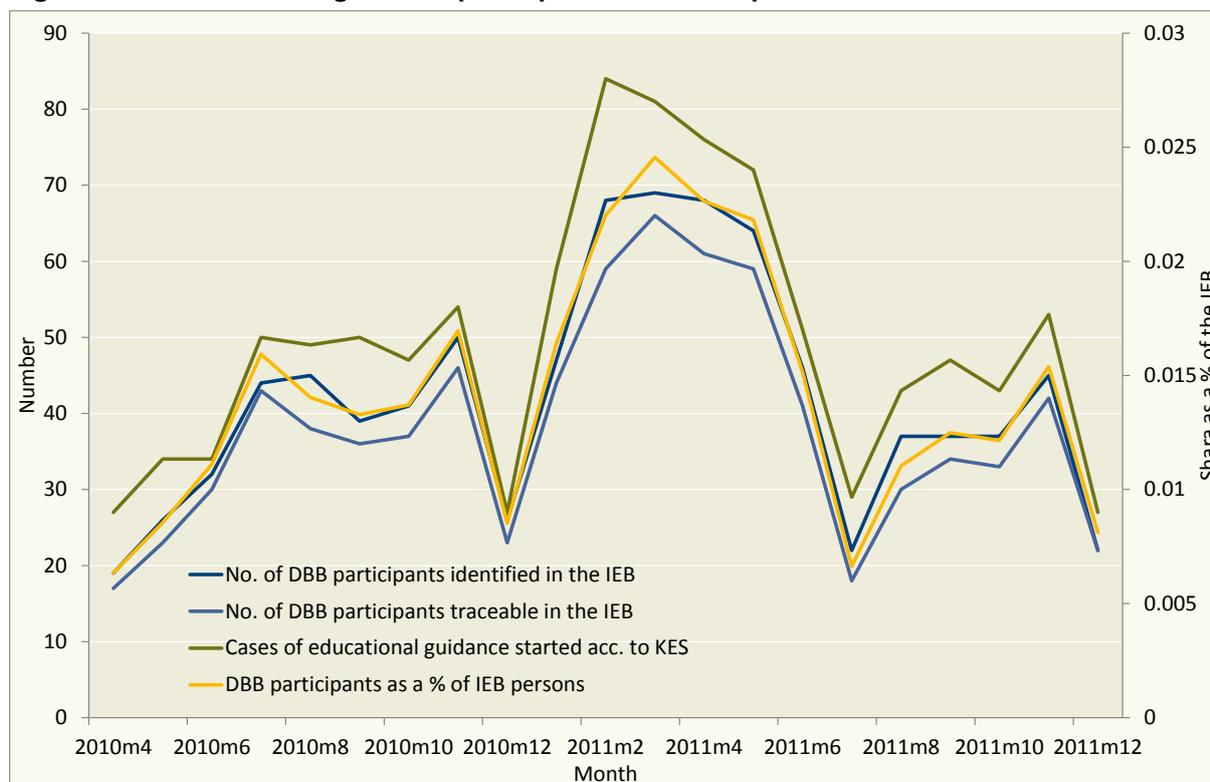
3.2 Data linkage

In order to link the KES data and the address data of the BA statistics department, the individuals' first names and surnames, the district in which their place of residence is located, their gender and their date of birth are used. The names are first standardised with regard to their spelling and are then compared in a multi-stage procedure to examine their similarity in the two datasets. The exact procedure is described in the Appendix (Table A 1). The threshold value for the decision criterion is selected in such a way that minor differences in the spelling of names (for example due to transposed letters) are permitted; an additional criterion is that the date of birth in the KES record has to correspond precisely with the person's date of birth in the address data of the BA. During the course of the data linkage procedure 884 of the 920 individuals resident in Dresden and receiving educational guidance were retrieved in the BA address data and matched with their corresponding individual IDs in the IEB.

87 individuals do not have an active IEB account at the time when they receive educational guidance, however, i.e. they are neither employed in an active employment relationship nor registered as a benefit recipient who is fit for work, a jobseeker or an unemployed person. Some of these people may have switched from a job covered by social security to a position as a civil servant or have become self-employed, with the result that social security contributions are no longer paid for them. Others may have a dormant employment relationship - they have taken unpaid leave, parental leave or long-term sick leave. Of this group we only include those individuals in the analysis for whom a return to active employment, benefit receipt or job-search activity can be observed following an interruption in employment. The following analyses cover a total of 802 individuals who participated in the "Dresdner Bild-

ungsbahnen” (DBB) educational guidance project . These individuals are termed persons receiving guidance, guidance participants or participants in the measure.

Figure 1: Number of guidance participants between April 2010 and December 2011



Source: IEB, own calculation and representation.

Figure 1 depicts the development of the cases of educational guidance started over time. It shows the sets of persons who were identified in the IEB and the persons who can be traced in the IEB (i.e. those for whom information is also available for the period around the educational guidance). For comparison purposes the set of cases of educational guidance begun in the respective month according to the KES original data is also depicted. The number of guidance participants whose employment history prior to the guidance is observable in the IEB is always somewhat smaller than the number of KES records. However, it follows the same progression over time, so no systematic sampling appears to have occurred.

3.3 Data preparation

In this study the data are structured on a monthly basis. For describing the target variables that are to be used to examine the effectiveness of the educational guidance, the individual's durations of unemployment, benefit receipt and employment as well as their monthly income are relevant. The information used to describe a person are their age, their gender, their vocational training and their employment history. The distributions of the variables are presented in Section 4; only a few are addressed here in order to explain the precise formation of the variables.

Employment-related data from different employment relationships are always aggregated here. The total pay from an employment relationship is divided by the number of months

worked in that job, and the gross monthly wages of all of a person's employment relationships are added together. In cases where a person has more than one job, the information regarding the occupation and such like is taken from their main job. All days on which an individual had a job covered by social security or a marginal part-time job with a daily wage greater than zero⁵ are counted as days of employment. All days on which the individual was registered as unemployed are counted as days of unemployment; days of benefit receipt are those days on which the person was in receipt of benefits in accordance with Social Code Book II or III.

Implausible values occasionally occur in the education and training variable in the IEB: for example, a person's education and training may be recorded as "unknown" although a vocational qualification is obligatory for their particular occupation; or a person is classed as a university graduate by one employer and as possessing no vocational qualifications by a subsequent employer. In order to correct erroneous values in the education and training variable, the variable is corrected following the third procedure suggested in Fitzenberger/Osikominu/Völter (2005) taking into account the records on benefit receipt and job-search (LEH, LHG and ASU).

For the variables concerning the stability of the employment history to date, "number of previous jobs" and "number of previous occupations", all employment relationships from 1 January 2003 onwards are used – these variables thus have to be understood as the number of changes of employer or occupation in the last eight years. A new job is defined as a notification of a new employment relationship in a different establishment from the last one. It may also be a change to a different establishment within the same company, however, since individual establishments are recorded in the IEB data, not companies.

4 Guidance participants compared with non-participants

In the following, education-related, sociodemographic and employment-related characteristics of the participants in the "Dresdner Bildungsbahnen" guidance project are presented and compared with the Dresden population recorded by the IEB. New entries to the guidance scheme occur in the period between April 2010 and December 2011 (the last month considered here). The data on the comparison group of Dresden citizens is collected at two different times: May 2010 and October 2011⁶.

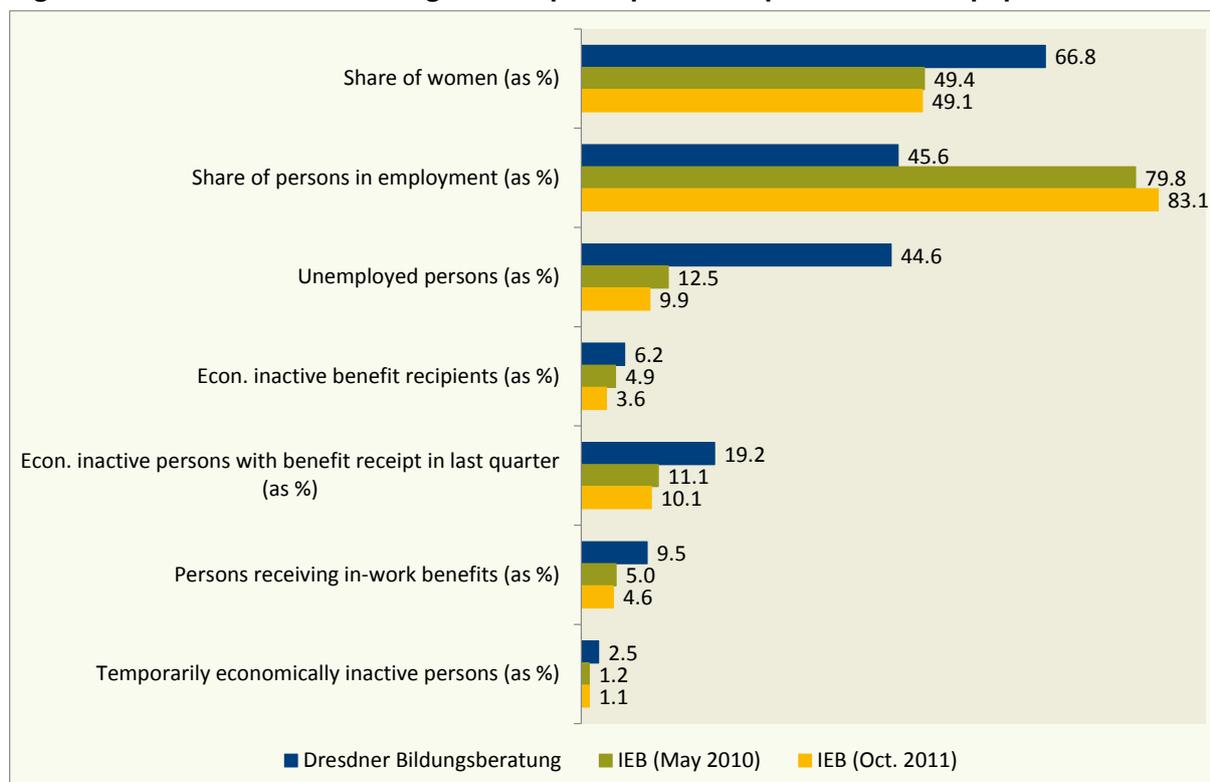
In Figure 2 the participants in the "Dresdner Bildungsbahnen" project are first compared with the population of Dresden on the basis of shares concerning basic sociodemographic and employment-related characteristics. Two out of three participants are women, whereas women account for only just under half of the individuals in the IEB for Dresden. The fact that women are overrepresented in the "Dresdner Bildungsbahnen" might be due to a less fa-

⁵ Employment relationships with a daily wage of zero result from unpaid leave, long-term sickness, maternity protection or parental leave. Such dormant employment relationships are classed as economic inactivity in this study.

⁶ October 2011 is shortly before the end of the observation period but is affected less by seasonal factors (such as winter unemployment or the payment of Christmas bonuses) than November and December and can therefore be regarded as more strongly representative of other months.

vourable employment situation. It may also result from the fact that men are less receptive to guidance and seek it less frequently.

Figure 2: Characteristics of guidance participants compared with total population



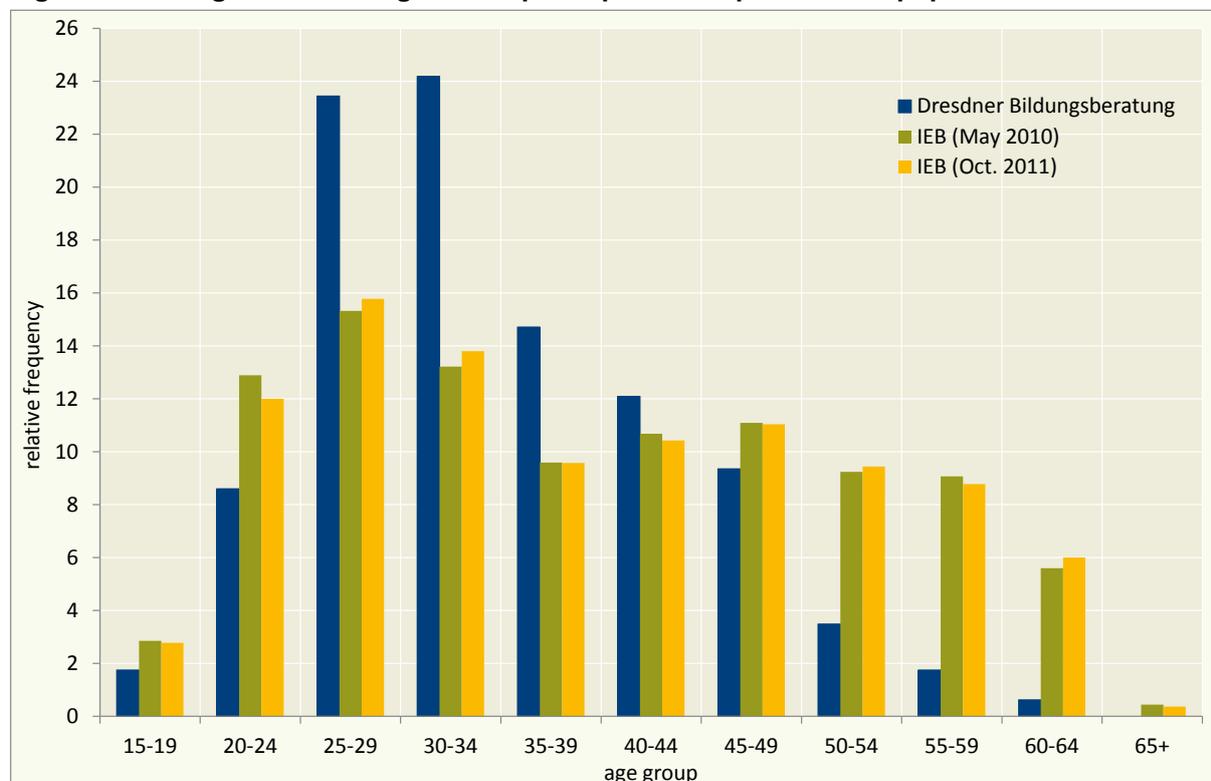
Source: IEB, own calculation and representation.

Unemployed and employed persons account for approximately equally large shares of the guidance participants, whereas their ratio in Dresden as a whole is 1:7 to 1:8. Educational guidance is therefore used to a far greater extent by unemployed individuals than would be expected according to their share of the Dresden population. The share of guidance participants who are in receipt of in-work benefits to top up low wages in accordance with Social Code Book II is also large in relation to this group's share of the population; about one in four employed persons receiving guidance in the "Dresdner Bildungsbahnen" project belongs to this group. It is also noticeable that the share of this group as a percentage of the guidance participants is only half as large as the share of unemployed persons – while economically inactive people who are fit for work and in receipt of benefits in accordance with SGB II and SGB III in the last three months in Dresden as a whole account for a similarly large share as the unemployed. This difference can be explained in particular by unemployed persons who live in households whose income is so high that they are not classed as needy in the sense of Social Code Book II but who are not entitled to benefits from unemployment insurance either.

A look at the age structure of the guidance participants in Figure 3 shows that the offer of educational guidance in the "Dresdner Bildungsbahnen" project is hardly used by people

under the age of 20 or over the age of 49.⁷ People aged from 25 to 34 are strongly overrepresented – e.g. people planning to return to working life after starting a family or people with questions concerning (further) career advancement.

Figure 3: Age structure – guidance participants compared to the population as a whole



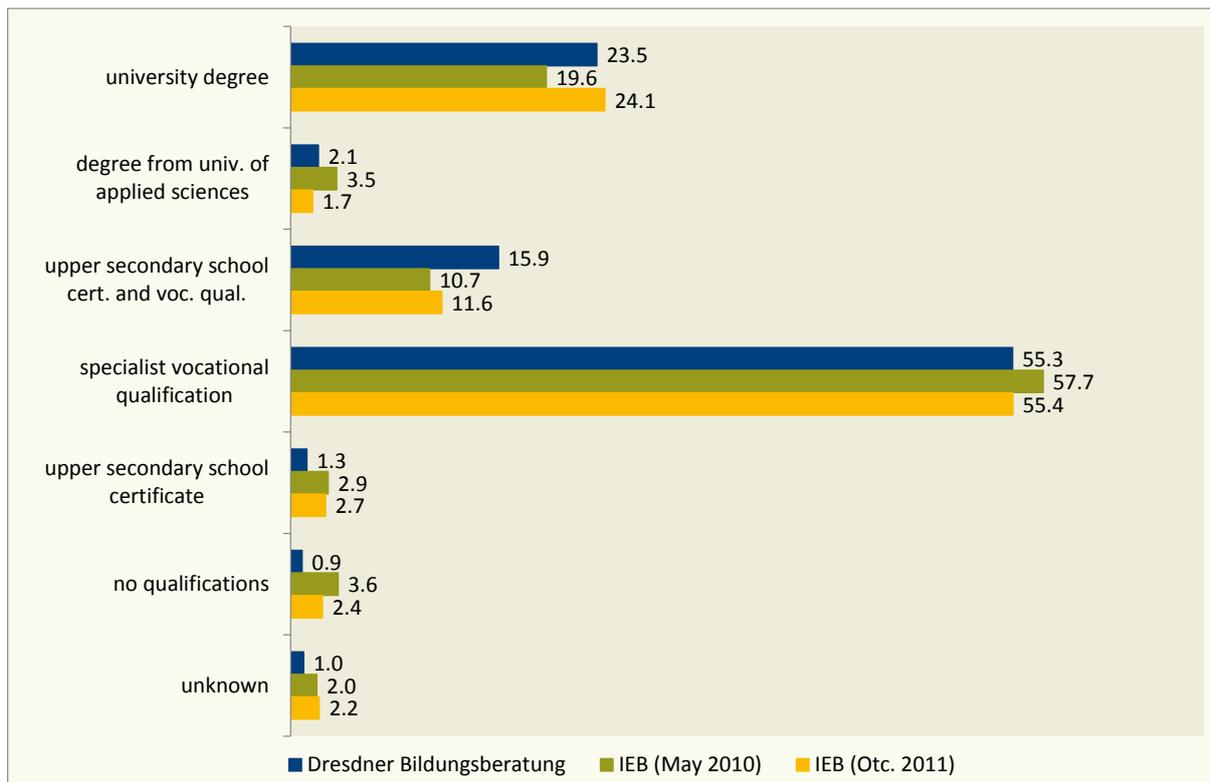
Source: IEB, own calculation and representation.

The participants in the “Dresdner Bildungsbahnen” project are generally well qualified (see Figure 4). The share of those with no school or vocational qualifications is smaller than the average of all Dresden inhabitants. A disproportionately large share of the guidance participants have both an upper secondary school leaving certificate (Abitur) and a vocational qualification.

The horizontal breakdown of vocational education is orientated towards the differentiation into occupational groups according to Blossfeld (1985). The categories “agricultural occupations” and “low-grade manual occupations” are combined here, however, as are “technical occupations” and “engineering occupations”. In 2011, the 2010 Classification of Occupations was introduced in the systems of the Federal Employment Agency; information regarding occupations in the IEB V11.00.00 for that year are erratic as a result of problems with the changeover. For this reason the occupational group of the occupation held twelve months previously is uniformly used as the information about the occupation.

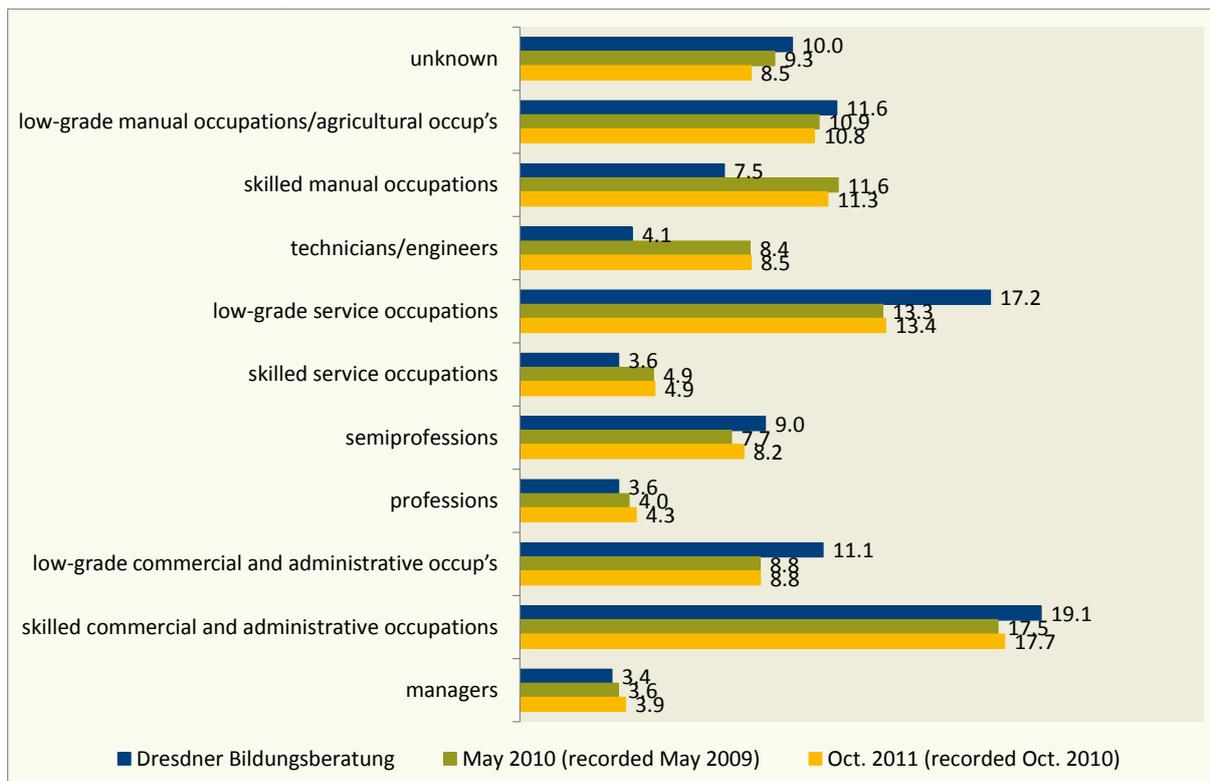
⁷ For school-leavers and young adults there are also other services available which are geared more towards entry into working life and initial vocational guidance. According to information from the Dresden Education Office, potential participants are generally referred to these services. An “initial guidance interview” is only recorded if the “Dresdner Bildungsbahnen” project does actually offer the appropriate service.

Figure 4: Skill level – guidance participants compared with population as a whole



Source: IEB, own calculation and representation.

Figure 5: Occupational group affiliation one year ago – guidance participants compared with population as a whole

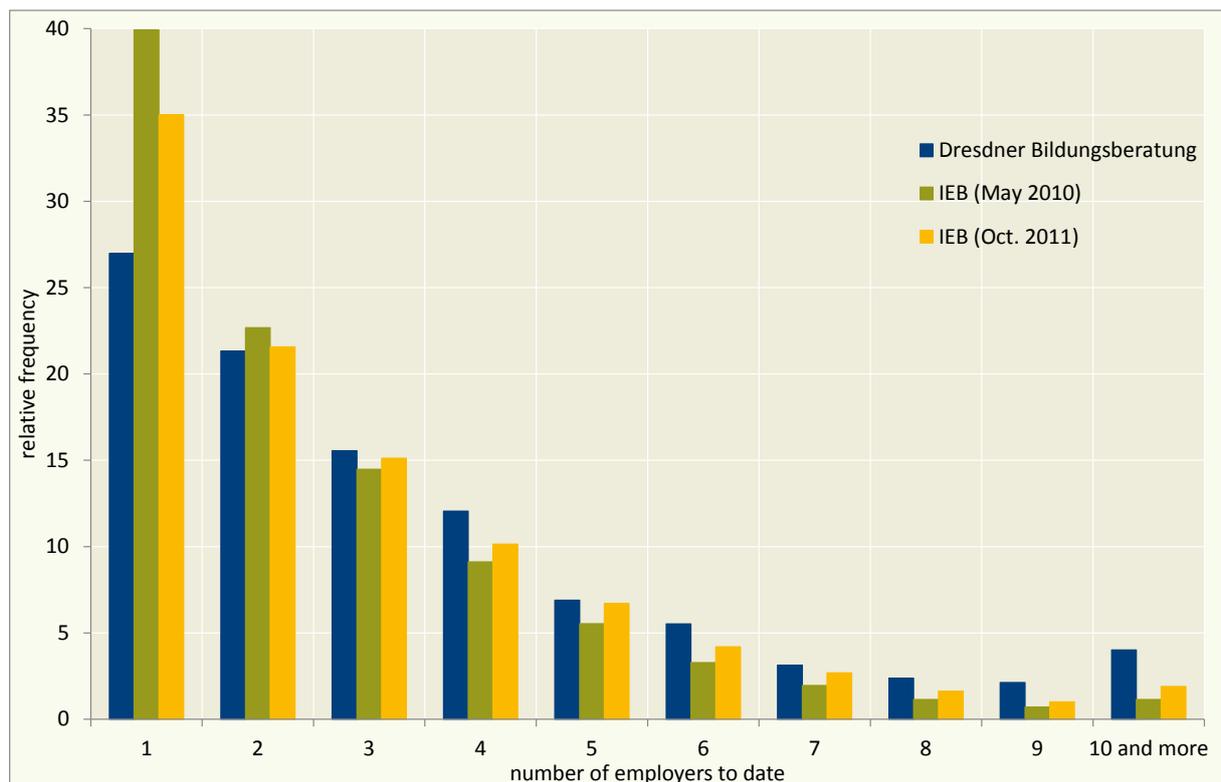


Source: IEB, own calculation and representation.

Figure 5 shows that above all people from low-grade service occupations and low-grade commercial/administrative occupations make more use of educational guidance. Individuals with skilled manual occupations or technical and engineering occupations, in contrast, participate less frequently in relation to their share in the IEB.

The participants in the “Dresdner Bildungsbahnen” project exhibit a comparatively more unstable employment pattern than the overall Dresden population. Figure 6 shows the number of establishments (as a proxy for the number of employers) in which a person was employed during the last eight years. It is noticeable that the proportion of the individuals receiving guidance who have changed establishment quite frequently (three or more times) is larger than the corresponding share of the Dresden population. The fact that the proportion of the guidance participants who have not changed establishment in the past few years is considerably smaller than the corresponding proportion of the population of Dresden may partly be a result of the age structure. Younger individuals with short employment histories have had fewer opportunities to switch establishment due to their shorter duration of employment overall (which is often less than eight years). Changes of establishment are also quite rare among older workers.

Figure 6: Number of employers to date – guidance participants compared with population as a whole

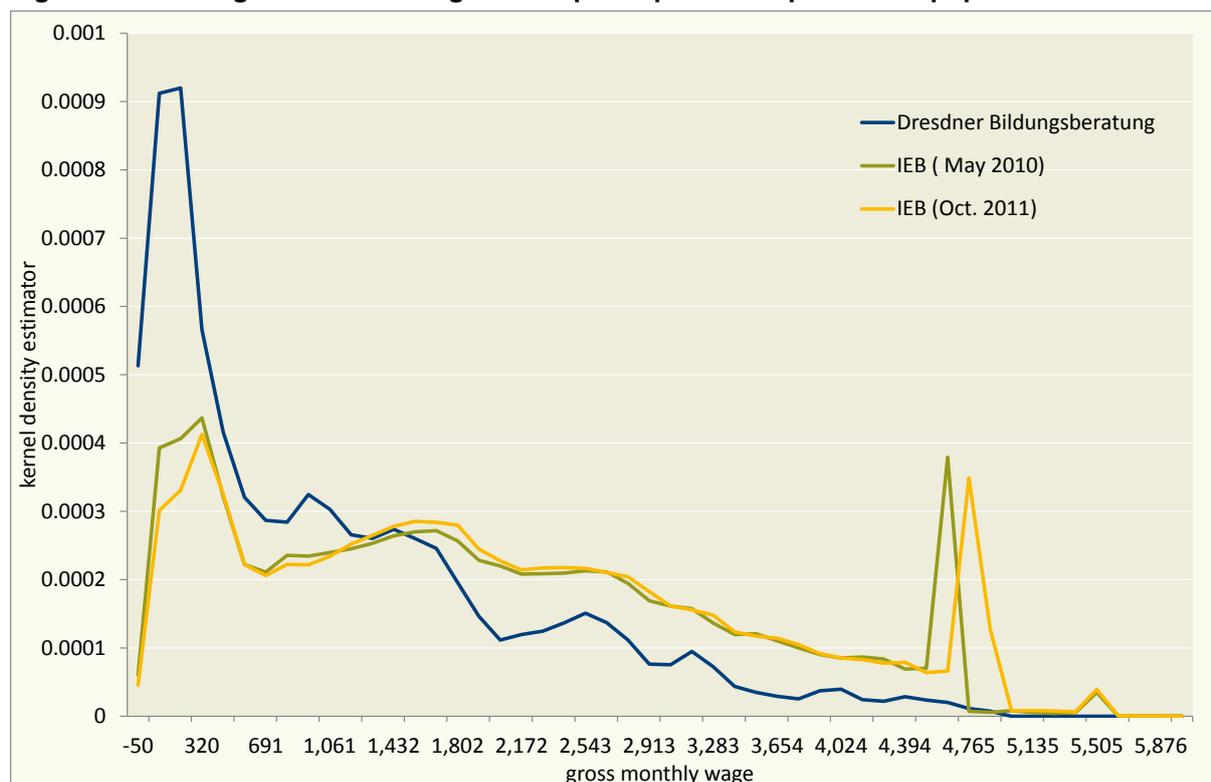


Source: IEB, own calculation and representation.

The distribution of the workers’ gross monthly wages is portrayed in Figure 7: the “estimated kernel density” portrays the probability density for each point of the wage distribution from which the probability for certain income groups (e.g. a wage between € 500 and € 600) can be calculated. It can be seen that a disproportionately large number of people with a monthly

wage below € 1,500 make use of the educational guidance service and that individuals who earn more than € 2,000 per month hardly do so. The peak at an income around zero is because unemployed persons account for a considerable proportion of the guidance participants. The wage distribution of the educational guidance participants therefore diverges visibly from that of the population as a whole.

Figure 7: Wage distribution – guidance participants compared with population as a whole



Source: IEB, own calculation and representation.

The participants in educational guidance are therefore female to a disproportionate extent, aged between 25 and 50 and have a good skill level (a vocational qualification, upper secondary school leaving certificate and a vocational qualification, or a university degree). Nonetheless the guidance participants are frequently unemployed or economically inactive. When guidance participants are in employment they often have below-average earnings.

5 The concept of the impact analysis

5.1 The Neyman-Rubin causal model

In theoretical terms the best possibility for determining the causal effect of a treatment (a measure) is a large-scale controlled experiment with random assignment to the treatment and the control groups (with the latter group ideally receiving a placebo). In the absence of the (ethical) permissibility of field experiments and due to difficulties in conducting genuine experiments to examine policy interventions, in the social sciences a quasi-experimental approach is often used that was developed by Rubin (1974) on the basis of concepts by Neyman (1923).

In a similar way to a genuine experiment, the effect of a measure is determined here by comparing potential outcomes of the target variable for the same person (e.g. their earnings level, the likelihood of a transition into employment or their future duration of employment) when treated or not treated with a measure. The problem arises here that only one of the two states can be observed, the other one being counterfactual (i.e. was not realised). In order to estimate the state that did not exist for a person, an “expected value” is calculated for them on the basis of individuals who correspond with the person in as many observable characteristics as possible, or differ only slightly. The precondition for this is that the characteristics in question are present in corresponding forms in both the treatment group and the control group, in other words that so-called “common support” exists. If, for example, the treatment group comprises only individuals aged between 25 and 45, it is not expedient, in fact it may even be misleading, to use individuals under the age of 25 and over the age of 45 in the control group.

A second important assumption concerns the part of the variation in the target variables (e.g. unemployment duration, wage etc.) that cannot be determined by means of observable characteristics (e.g. skill level, gender or age) and is modelled as random. This unexplained variation must not be related in any way to the random component in the assignment to the treatment or the control group – as is the case, for example, in a genuine experiment. If assignment to guidance/non-guidance and the target variables are conditionally independent after controlling for the individuals’ observed characteristics, the average treatment effect (ATE) and the average treatment effect on the treated (ATT) can be calculated by comparing the expected values. A complication arises if assignment to the treatment is not independent of the potential outcome and individuals select themselves into the treatment. It is then only possible to identify the treatment effect if variables or events that influence the likelihood of participation in the treatment can be determined without determining the treatment effect at the same time. Because the participation likelihood changes only within a restricted range of values, the estimated effect describes only a local average treatment effect⁸ (LATE). The ATE and ATT, on the other hand, permit more general statements.

The determination of the effect is also based on a third assumption, which can be regarded as being satisfied here. The values of the target variable in the realised and the counterfactual states must not be influenced by another person’s treatment (stable unit treatment value assumption (SUTVA)).

⁸ See on this subject Angrist/Pischke (2009), p. 155 ff and p. 259 ff.

If Y_1 denotes the (potential) value of the target variable after treatment and Y_0 the (potential) value of the target variable without treatment, D is an indicator variable for participation in the treatment and X the observed characteristics, then, under the assumption of common support, SUTVA and conditional independence, the average treatment effect on the treated is estimated as

$$\begin{aligned} ATT &= E(Y_1 - E(Y_0|X, D = 1)|X, D = 1) \\ &= E(Y_1|X, D = 1) - E(Y_0|X, D = 1) \end{aligned}$$

and the average treatment effect as

$$\begin{aligned} ATE &= E(Y_1|X) - E(Y_0|X) \\ &= ATT + E(Y_0|X, D = 1) - E(Y_0|X, D = 0) \end{aligned}$$

where $E(Y_0|X, D = 1) - E(Y_0|X, D = 0)$ indicates the influence (the bias) generated by selection into treatment.

5.2 Identification under the assumption of randomisation

If the three assumptions above are valid, the average treatment effect (ATE) can be determined on the one hand by means of a linear regression of the target variable Y on the treatment indicator D and the control variables X . A common alternative is the use of matching estimators, which aim to identify individuals in the control group who are as similar as possible to individuals in the treatment group, and vice versa. In this study we use a Mahalanobis matching estimator (see Rubin 1980; regarding the implementation see Leuven/Sianesi 2003).⁹

In principle the estimates are restricted to individuals aged between 20 and 49. Employed persons with gross monthly earnings exceeding € 4000 are also excluded. The analyses are conducted separately for people who were in employment at the time of the (potential) start of educational guidance and those who were economically inactive at that time. The group of economically inactive persons comprises individuals with the status of unemployed as well as all those participating (full-time) in a further training measure funded by the Federal Employment Agency, all workers in dormant employment relationships (employed with a wage equal to zero) and the persons who dropped out of the IEB temporarily and were seen to re-enter the dataset later.

In all the estimates age is controlled for by means of allocation to an age group covering five years, gender is controlled for via an indicator variable. A person's skill level is depicted first via indicators for the highest vocational qualification attained (including upper secondary

⁹ Numerous evaluation studies use matching approaches based on the propensity score, an estimate of the conditional probability of receiving the treatment. In the case of the "Dresdner Bildungsbahnen" project the case numbers are so small in relation to the overall Dresden population that the underlying relative frequency or the unconditional baseline probability of receiving educational guidance takes on a very small value. Consequently the conditional probabilities also only exceed a threshold of 10% for a small number of people; on average the conditional probability is 1.0 – 2.5 %. These values are too low to be used to determine similarity in a way that is reasonable and reliable.

school leaving certificate), second by the affiliation to occupational groups (with a time lag of one year), and third, via the length of time that a person has spent in labour market policy training measures during the last eight years. The more recent employment history is portrayed by the number of days of unemployment, employment and benefit receipt in the last three months and the last year (each in linear and squared form) and by the duration of the current employment status to date (in the case of economically inactive persons). In addition, there are indicator variables for the number of job changes and occupation changes in the last eight years.

In the subsample of employed persons, the monthly earnings at the time when educational guidance was begun is also controlled for. In addition, an indicator variable is incorporated that indicates whether a person in employment is going to become unemployed during the next three months (and should therefore have registered as a jobseeker in accordance with the current legal situation).

The estimate of the wage effect includes a variable that takes into account the different probability of a person also actually being in employment at the respective point in time, a so-called inverse Mills ratio (see Franz 2006, p. 67ff.; Heckman 1979). For this, a “probit model” is first estimated across all persons at all points in time using the binary dependent variable of whether a person is in employment. The term is identified via the temporal variation in the explanatory variables, which may take on different values at the time of the educational guidance than at the time for which the Mills ratio is calculated.

5.3 Identification in the case of self-selection into educational guidance

It may be called into question whether participation in educational guidance can be regarded as random and whether it is independent of the outcome of a potential guidance. An assignment that is associated with the potential outcome or the participants self-selecting into the measure distorts the treatment effect estimated using the matching procedure, however, if the available information (e.g. gender, age etc.) cannot fully explain the participation in the measure – and even more so the more strongly the distributions of the participation likelihoods of participants differ from those of the non-participants.

A selection can be taken into account if information is available that is associated with the likelihood of participation but does not simultaneously influence the target variable that is being used to assess the treatment effect. The introduction of the “education bus” in May 2011 and the extension of educational guidance to include the local employment offices in the districts of Gorbitz, Johannstadt-Nord and Seidnitz/Dobritz in September 2011 (see Landeshauptstadt Dresden 2012, p. 327ff) are possible sources of variation (inconsistencies in the structure or discontinuities). However, in the dataset the case numbers for educational guidance are so small (fewer than 70 initial guidance interviews respectively in April and May 2011, fewer than 50 in September and October 2011) that it is not possible to calculate any robust expected values for the subsamples for the months around the time of the structural inconsistencies.

Alternatively, a variation in the participation likelihoods could also originate from observed variables at individual level. The IEB, however, primarily contains variables that are associat-

ed with the individuals' employment histories and are therefore not uncorrelated with the target variables. The KES data, on the other hand, include some variables that may explain the personal motivation of the guidance participants. The dummy variable of the continuation of educational guidance after the initial guidance interview can be used to form a measure of the intensity or the probability of educational guidance. However, first attempts to use this measure in an instrumental variables approach to estimate the effect of educational guidance did not yield any reliable findings. Consequently, neither of the possibilities to take into account in statistical terms a link between participation in educational guidance and the outcome of the guidance is expedient here. The treatment effects can only be estimated under the assumption of random assignment to treatment or non-treatment.

6 Findings of the impact analysis

6.1 Analysis for individuals not in employment at the start of guidance

6.1.1 Participation in the educational guidance scheme

As was explained in Section 5.2, the randomness of participation or non-participation in educational guidance plays an essential role in whether the estimated difference between the treated and the non-treated can be interpreted as a causal effect. Selection on the random, unobservable component cannot be measured directly. According to Altonji/Elder/Taber (2005) selection on unobservables behaves in a similar way to selection on observables.

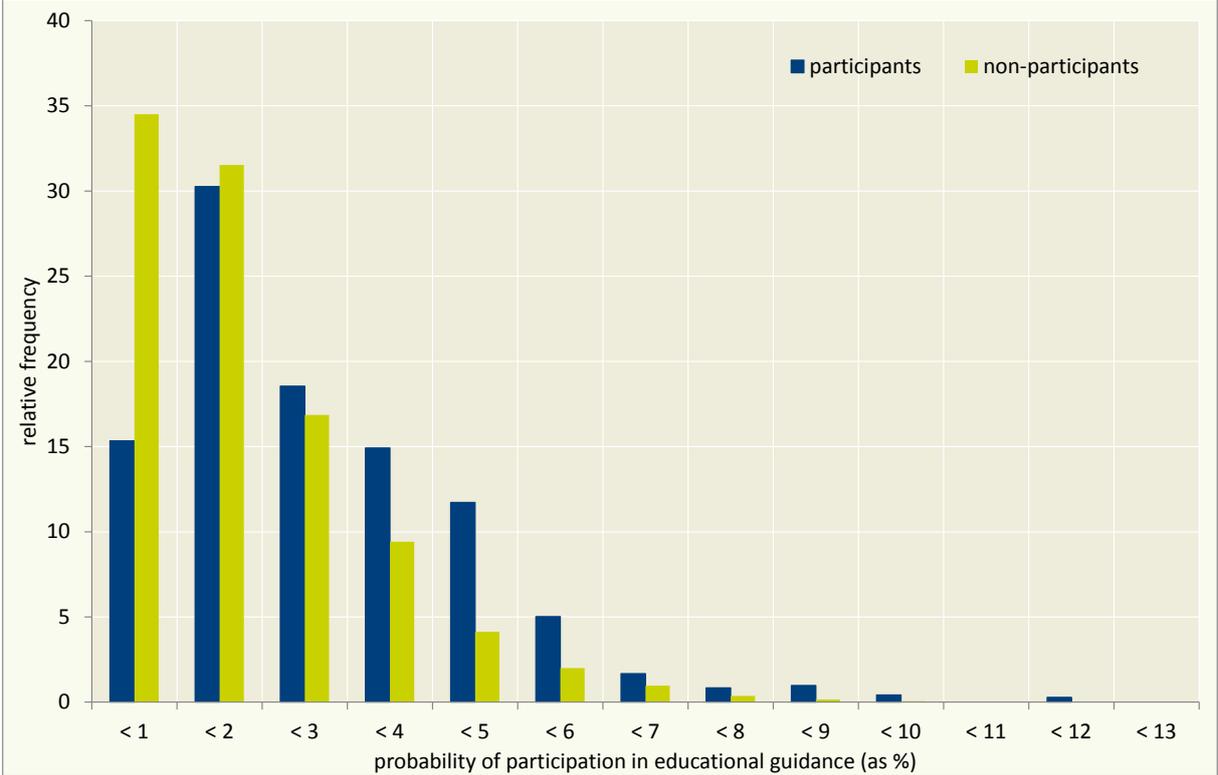
In order to assess this, participation in the educational guidance scheme is first explained in statistical terms. This estimate, which includes various individual characteristics, is then used to calculate a likelihood of educational guidance for each person. The estimated parameters are shown in Table A 3 in the appendix. In the case of people who are economically inactive, especially gender, age and the last occupation are important factors for explaining participation in educational guidance. Additionally, the amount of unemployment and benefit receipt in the last three months plays a role. The more time an economically inactive person has already spent in further training measures for the unemployed, the less likely they are to participate in educational guidance.

Figure 8 shows the estimated probabilities for the individuals who were economically inactive at the time when they participated in the guidance scheme and the population of economically inactive persons drawn from the control group.¹⁰ The probabilities of participating in educational guidance are depicted on the horizontal axis, whereby the value "<2" means that for the individuals in this group the likelihood of participating in educational guidance is between one and under two percent. One in two guidance participants and one in two non-participants exhibits a participation likelihood of between one and three percent. Non-participants exhibit a participation likelihood of less than one percent disproportionately often. A participation likelihood of more than three percent is found disproportionately frequently for people who

¹⁰ The individuals in the samples switch to a small extent between the target variables used to assess the effectiveness of the educational guidance scheme. The reason for this is the availability of the explanatory variables included in each case (for the wage estimates, for instance). The estimation results shown refer to the estimate associated with the target variable "cumulative duration of unemployment" (see next section).

participated in the guidance scheme. However, the highest estimated participation likelihood is found for a person from the group of non-participants. For a large proportion of the economically inactive individuals the probabilities of participating in educational guidance are balanced; for virtually every person who participated in the scheme there is a person with a similar participation likelihood who did not take part in the scheme. The average treatment effect on the treated (the ATT) to be estimated can therefore be expected to be only slightly biased by selection into the treatment and the non-treatment group.¹¹

Figure 8: Estimated probability of participation in educational guidance (as %), participants compared with non-participants – economically inactive persons



Source: IEB, own calculation and representation.

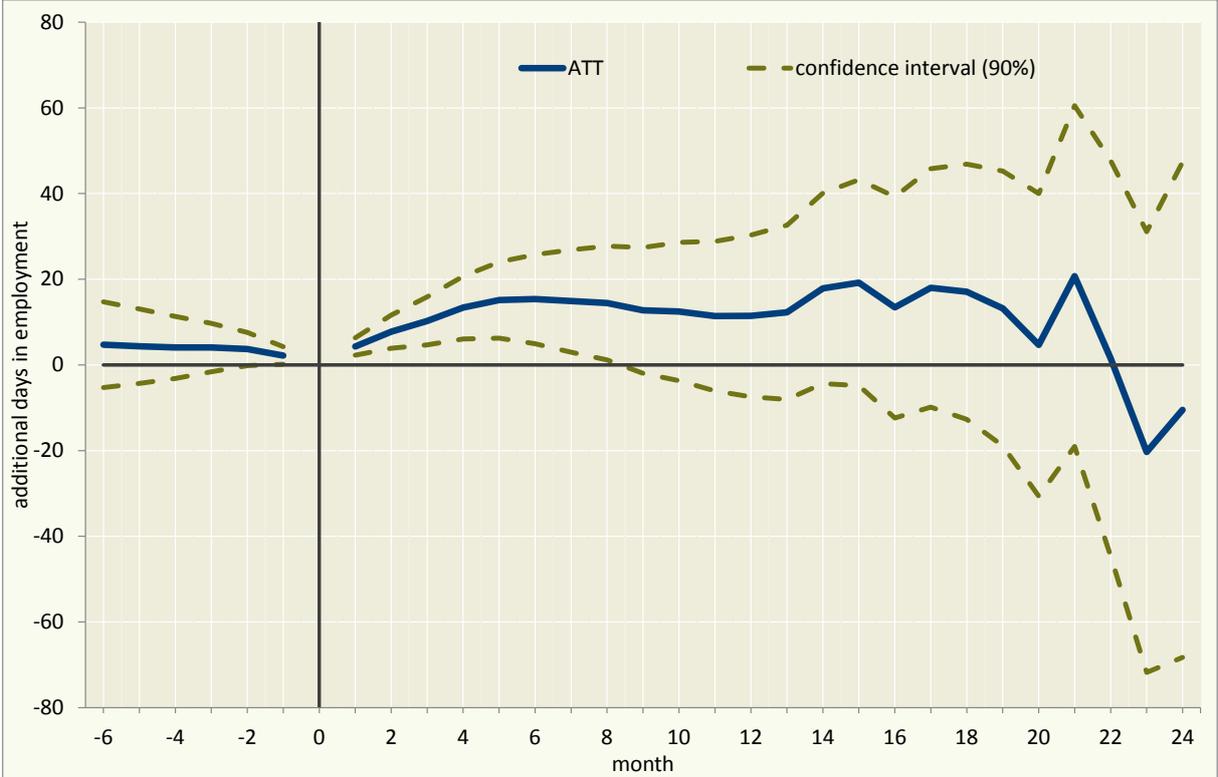
6.1.2 Impact of guidance on unemployment, employment, earnings and benefit receipt

The impact of educational guidance, which is estimated using a counterfactual approach, is portrayed in diagrams below. The horizontal axis depicts the number of months from the start of guidance (which takes place at the point in time 0), i.e. the (potential) employment histories are followed for a period lasting up to two years from the start of educational guidance. The solid blue line indicates the average treatment effect on the treated (ATT). The dashed green lines show the range within which the treatment effect is to be found with a 90 percent probability with the calculated estimation error. If the lower boundary is above zero (or the upper boundary is below it), the effect is considered statistically significant.

¹¹ The average treatment effect in the overall population (ATE) can be assumed to differ from the ATT, as a large proportion of the non-participants – in contrast to the participants – has a participation likelihood of under one percent.

In Figure 9 an increase in the number of days of unemployment can initially be seen for people who were economically inactive at the time when they received educational guidance. Three months after the start of educational guidance a participant is unemployed for a good ten additional days compared with the expected value for if the guidance had not taken place. The increase in the duration of unemployment grows until the sixth month and then remains roughly constant with slight fluctuations. After just under two years guidance participants appear to have spent fewer days in unemployment in total than they would have done without guidance. It must be taken into account, however, that only the increase in the duration of unemployment during the first eight months after the start of educational guidance is also statistically significant.

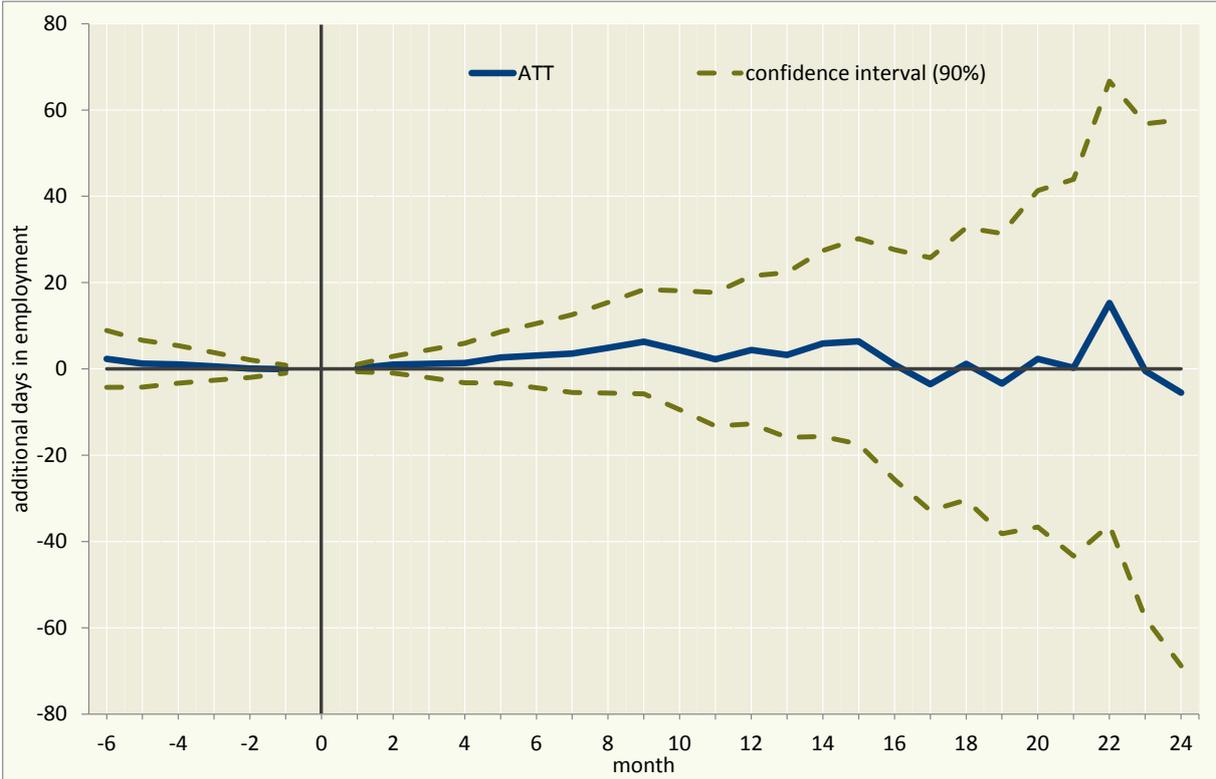
Figure 9: Additional days in unemployment (cumulative) – economically inactive persons



Source: IEB, own calculation and representation.

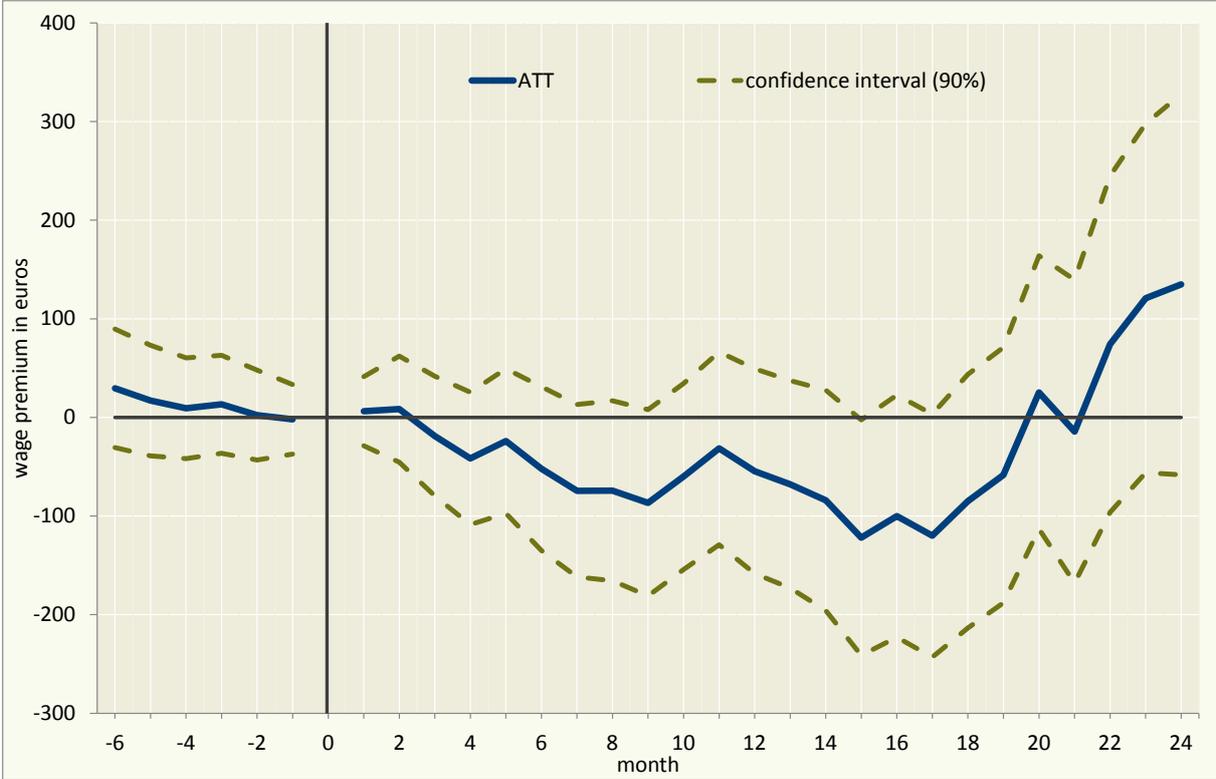
No significant effect can be found regarding the target variable “additional days in employment” (see Figure 10). The difference in the duration of employment of individuals who were not in employment at the time when they participated in educational guidance is close to zero throughout the entire observation period.

Figure 10: Additional days in employment (cumulative) – economically inactive persons



Source: IEB, own calculation and representation.

Figure 11: Wage effect (change in monthly earnings, in euros) with selection correction for the probability of working – economically inactive persons



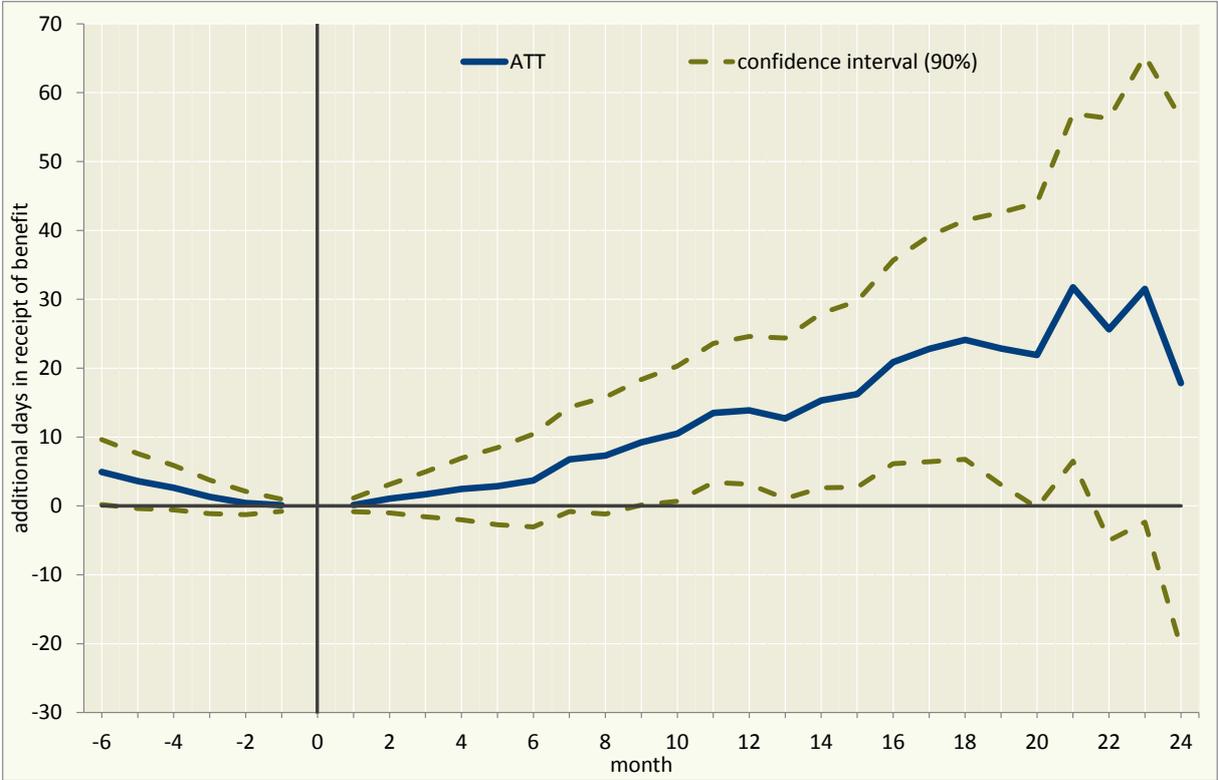
Source: IEB, own calculation and representation.

When examining the impact on earnings, the probability of a person also being in employment at the given time is additionally controlled for. In the first one and a half years after the start of the educational guidance, participation in the guidance scheme is more likely to lead to income losses of up to € 100 per month, though they are (barely) significant only in the 15th month. In contrast, from the twentieth month onwards we generally find income gains – which are also not significant – for people receiving guidance compared with the respective statistical twins (see Figure 11).

The fourth target variable examined is the change in the cumulative duration of benefit receipt in accordance with Social Code Book II or III as a result of the educational guidance (see Figure 12). Individuals who were economically inactive at the time of the initial guidance interview tend to draw benefits for more days as a result of the guidance. The gap between guidance participants and non-participants grows constantly. From the ninth month onwards the difference between participants and non-participants is also significant. From 22 months after the start of guidance the effect becomes insignificant again.

In terms of size, the increase in the number of days of benefit receipt in the first ten months is smaller than the increase in the number of days of unemployment. Both states then increase equally. After about one and a half years participants in the guidance scheme have spent just under one month longer in receipt of benefits or in unemployment. After that the two effects diverge again as the impact on unemployment decreases while that on benefit receipt remains more stable.

Figure 12: Additional days in receipt of benefit (cumulative) – economically inactive persons



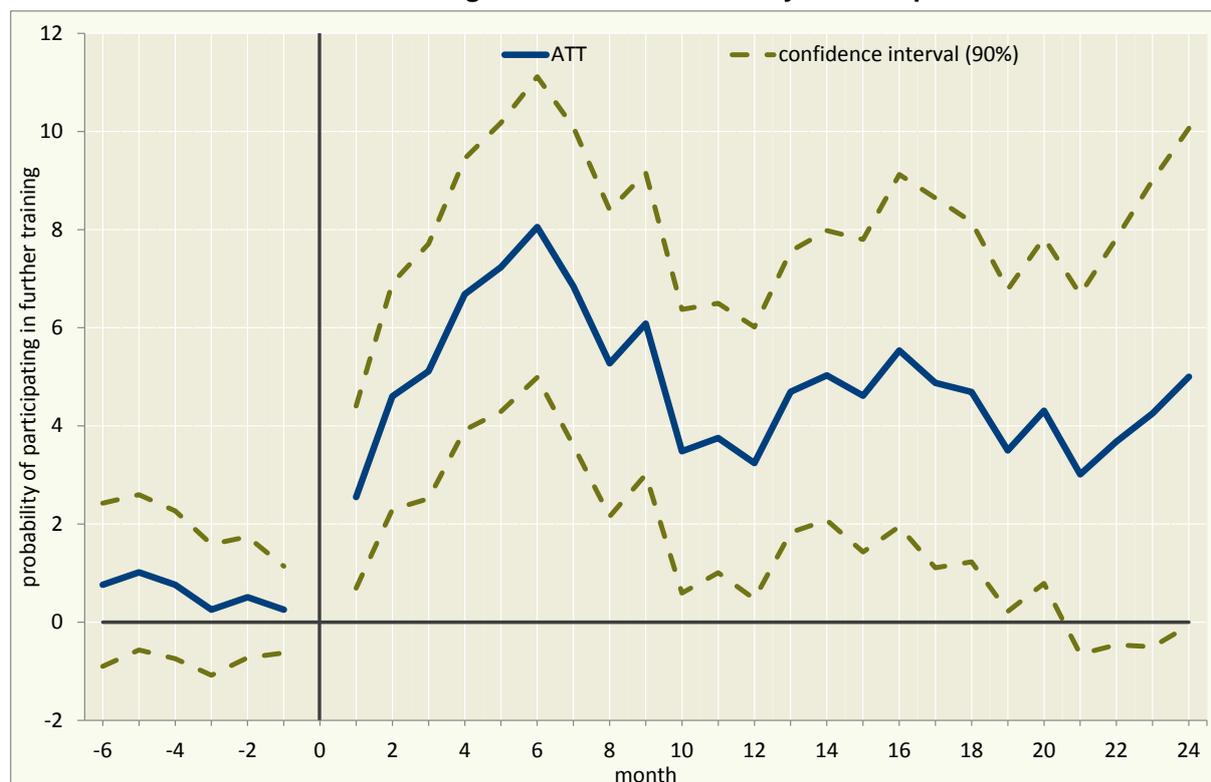
Source: IEB, own calculation and representation.

6.1.3 Impact on the probability of participating in further training

The analyses conducted so far showed an increase in the duration of benefit receipt in accordance with Social Code Book II or III for economically inactive guidance participants. Hardly any significant effects could be determined for other variables depicting labour market outcomes. These variables tended to be rather poor initially and only exhibited a reversal (in the sense of a reduction in unemployment or an increase in earnings) a relatively long time after the start of the guidance.

Educational guidance can only aim at influencing these target variables indirectly, however. The means to an end is always an education or training measure – selected as optimally as possible. Although the administrative data of the Federal Employment Agency can only depict a small range of possible education and training measures or funding possibilities for education and training¹², the data do permit a first approximation of whether educational guidance has an impact on participation in further training and if so, how long this lasts. In the sample of economically inactive individuals, this approximation will presumably be more accurate than in the sample of people in employment, which is discussed below. How strongly educational guidance increases the probability of an economically inactive individual taking part in a training measure recorded in the IEB is illustrated in Figure 13.

Figure 13: Increase in the probability (in percentage points) of participating in a publicly funded further training measure – economically inactive persons



Source: IEB, own calculation and representation.

¹² An additional requirement is that prior to the training measure the individual concerned was unemployed or classed as needy in the sense of Social Code Book II or was at least acutely in danger of becoming unemployed.

As early as two months after the start of educational guidance the probability of participating in a further training measure rises by more than four percentage points (from less than a one-percent probability of entering further training for those not receiving guidance to more than five percent for guidance participants). After six months the effect reaches its maximum of an eight percentage-point higher probability of entering further training for those receiving guidance. Only after ten months does the effect briefly fall back to a level of below four percentage points. A significantly increased probability of participating in a publicly funded training measure exists for about one and three quarter years.

On the whole one in five to one in six economically inactive individuals receiving educational guidance takes part in a further training measure funded by the Federal Employment Agency (or another body responsible for active labour market policy) at some time during the two years following the start of guidance. In contrast, viewed over time, not even one in fifty individuals in the control group takes part in further training at any time during the comparison period. However, it appears uncertain whether this effect really is causal. For instance, the decision to take part in further training may already have been made and the educational guidance may then only serve to provide information about possible measures or to help the participant to make the best possible choice. This would be in line with previous findings regarding the promotion of further training, according to which participation in and the volume of further training are determined more by the promotion measure than by the guidance (see Section 2.3). On the other hand, the guidance also of course points out possible promotion measures.

Irrespective of the causal direction, the increased probability of participating in further training after educational guidance implies a lock-in effect associated with the further training that lasts up to more than one and a half years after the start of the guidance. During this period participants in training measures reduce their job-search efforts: this may explain the effects on both earnings and the duration of unemployment. The periods with unfavourable effects and the times of the turning points correspond with distinctive points in time in the development of the effect on participation in further training.

6.2 Analysis for individuals in employment at the start of guidance

The structure of this section is the same as section 6.1. It first looks at possible selection and the resulting bias in the effects, then the effects on the labour market outcomes of those who received education guidance are discussed and finally the effect on participation in further training is addressed.

6.2.1 Participation in the educational guidance scheme

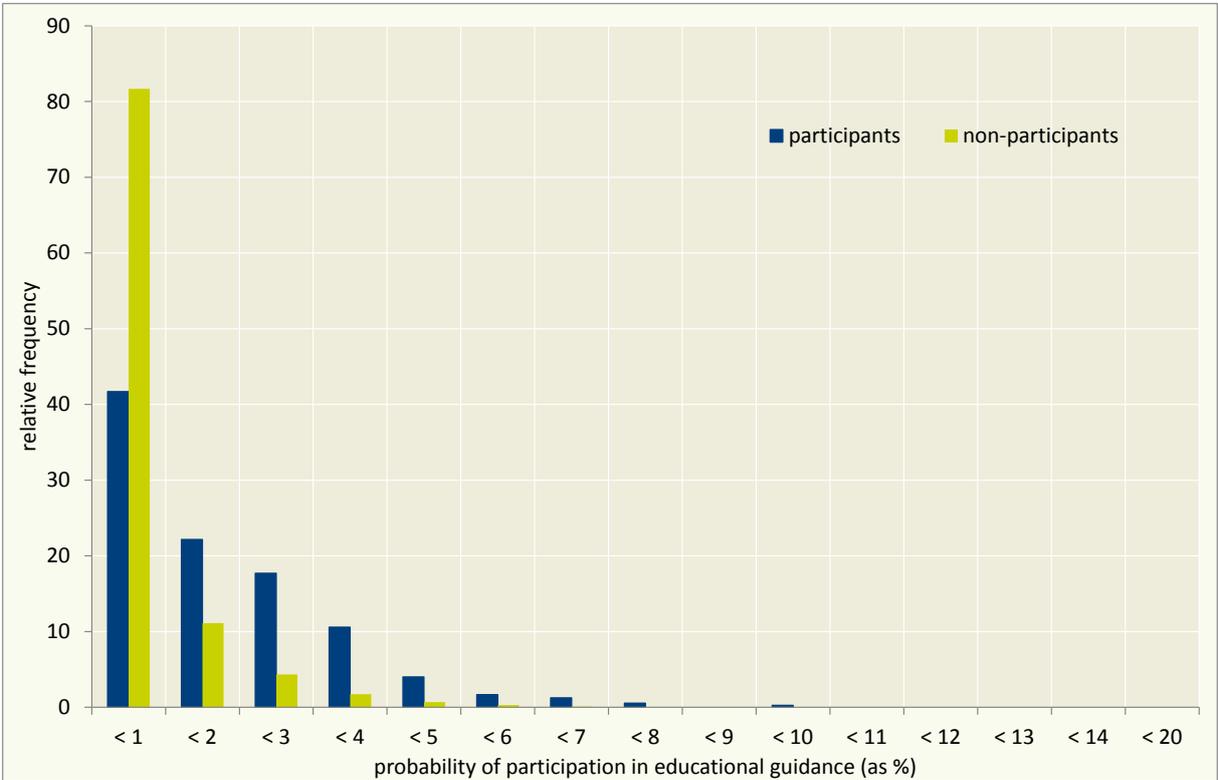
For the employed individuals the influence of additional characteristics on participation in educational guidance can be substantiated by statistics, as is shown by Table A 3 in the appendix. Here, in addition to gender, age and occupation, individual skill groups are also significant, although they were not found to have any influence for economically inactive individuals. The length of time that a person has spent in training measures funded under labour market policy shows no impact. In contrast, participation in educational guidance increases with the length of time that a person was unemployed in total and decreases with the level of gross monthly earnings. There is also a very clear positive correlation between participation

in educational guidance and a person becoming unemployed in the course of the first three months after the start of guidance (and therefore often having already registered as a jobseeker).

Figure 14 shows the estimated probabilities of guidance participants and non-participants receiving educational guidance for the individuals who were in employment at the (potential) time of the guidance. Here the probabilities are far more strongly polarised than is the case for the people who were not in employment at the start of the educational guidance: four fifths of non-participants have a guidance probability of under one percent, compared with two fifths of the participants. Where the guidance probability exceeds one percent, the relative frequency among the guidance participants is at least twice as large in each percentage step. This indicates a large degree of selection on observable characteristics. According to the argumentation of Altonji/Elder/Taber (2005), a selection on unobservables may thus also be of importance in the sample of people in employment.

The size of the effects estimated in the following therefore has to be viewed with stronger reservations than the effects in the sample of economically inactive persons. It is unclear in which direction the effects may be biased as there are two opposing mechanisms at work here. On the one hand it seems reasonable to assume that individuals are more likely to seek out educational guidance when they expect a greater effect on their labour market outcome. On the other hand, especially individuals whose outcome is currently below average (or below their own expectations) will presumably make use of the guidance service.

Figure 14: Estimated probability of participation in educational guidance (as %), participants compared with non-participants – employed persons

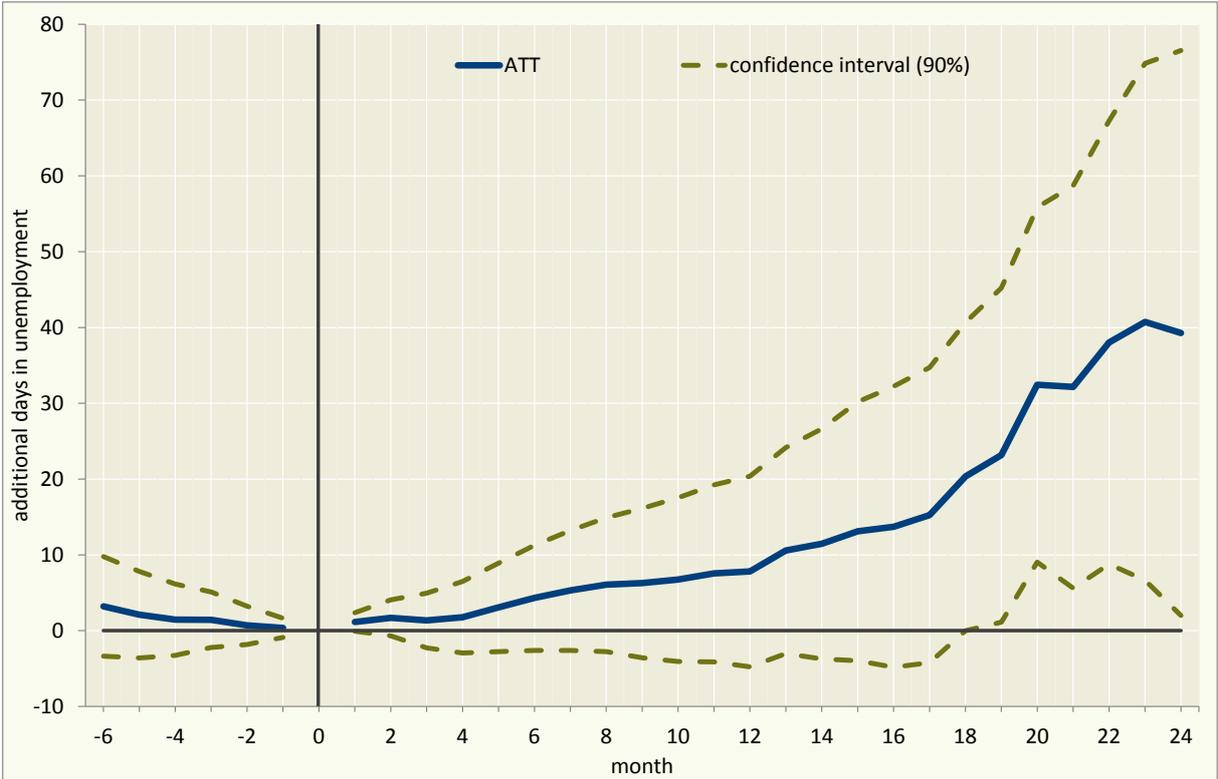


Source: IEB, own calculation and representation.

6.2.2 Impact of guidance on unemployment, employment, earnings and benefit receipt

Figure 15 shows the impact of educational guidance on the guidance participants' unemployment. The number of additional days in unemployment increases constantly. Throughout the first one and a half years the effect is not statistically significant; from the 18th month after the start of guidance the increase becomes larger and is then also statistically significant. On average a person who received educational guidance has been unemployed just under 40 days longer after two years than the comparable person who did not take part in the guidance scheme.

Figure 15: Additional days in unemployment (cumulative) – employed persons



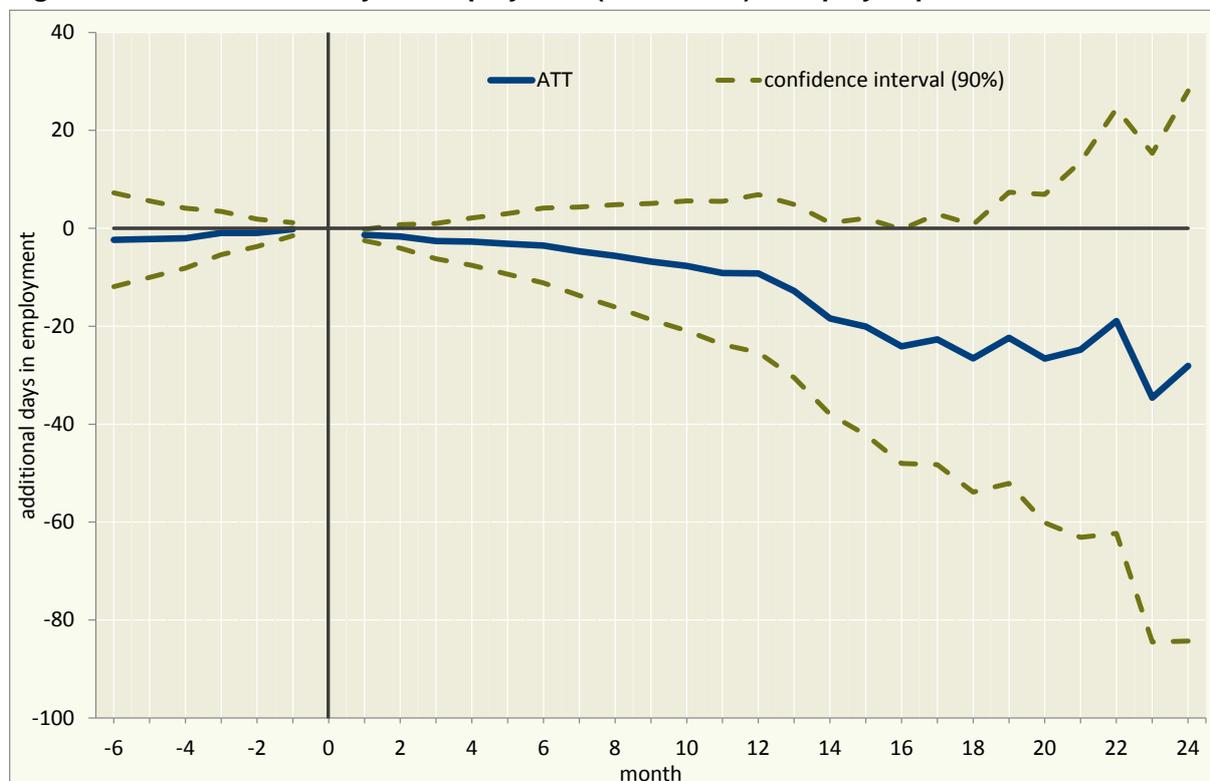
Source: IEB, own calculation and representation.

The impact on the duration of employment (see Figure 16) tends to correspond with the effect on the duration of unemployment. Here a growing gap is found in the number of days that a guidance participant is employed compared with the corresponding non-participant. However, it is not possible to rule out employment durations being equal in any month with 90 percent certainty.

Employed people would actually be expected to reduce their working hours, to end a second job or such like as a result of the educational guidance but not to give up work altogether. The reduction in the number of days of employment is partly the result of people who have a subsidised job or a marginal part-time job and draw benefits to cover their subsistence costs. In these cases, terminating the employment relationship in favour of further training is actually recorded as a reduction in the number of days of employment (whereas the person without benefit receipt would no longer be observable). However, the effects on the duration of un-

employment and employment are also partly due to individuals who probably already knew that they would soon become unemployed at the time when they began educational guidance.

Figure 16: Additional days in employment (cumulative) – employed persons

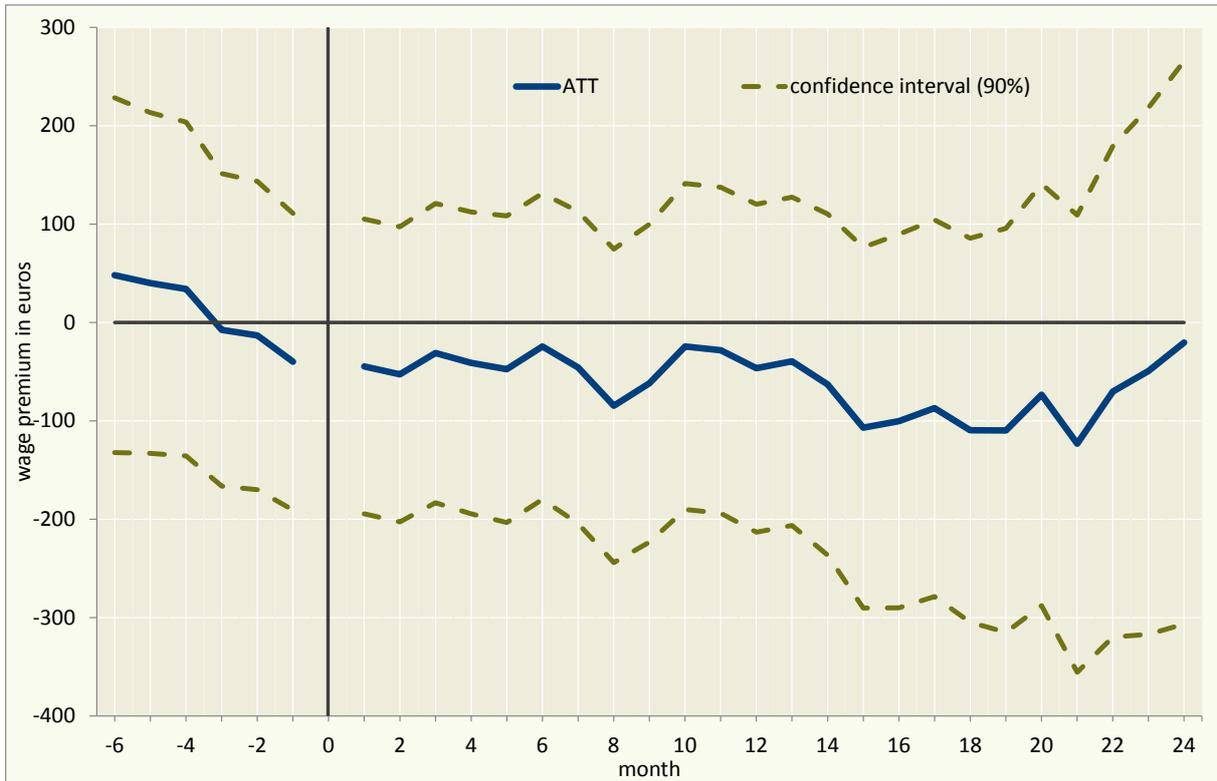


Source: IEB, own calculation and representation.

A slight (and never significant) negative effect is found regarding the guidance participants' gross monthly earnings (see Figure 17).¹³ The earnings loss is seldom more than € 50 in the first twelve months, then increasing to about € 100 per month and falling back towards zero again after just under two years. The effect on earnings is therefore of a similar magnitude for employed persons and for the economically inactive. This is astonishing in so far as we would expect employed people to reduce their working time during an in-work further training measure and to have larger decreases in their monthly wage as a result.

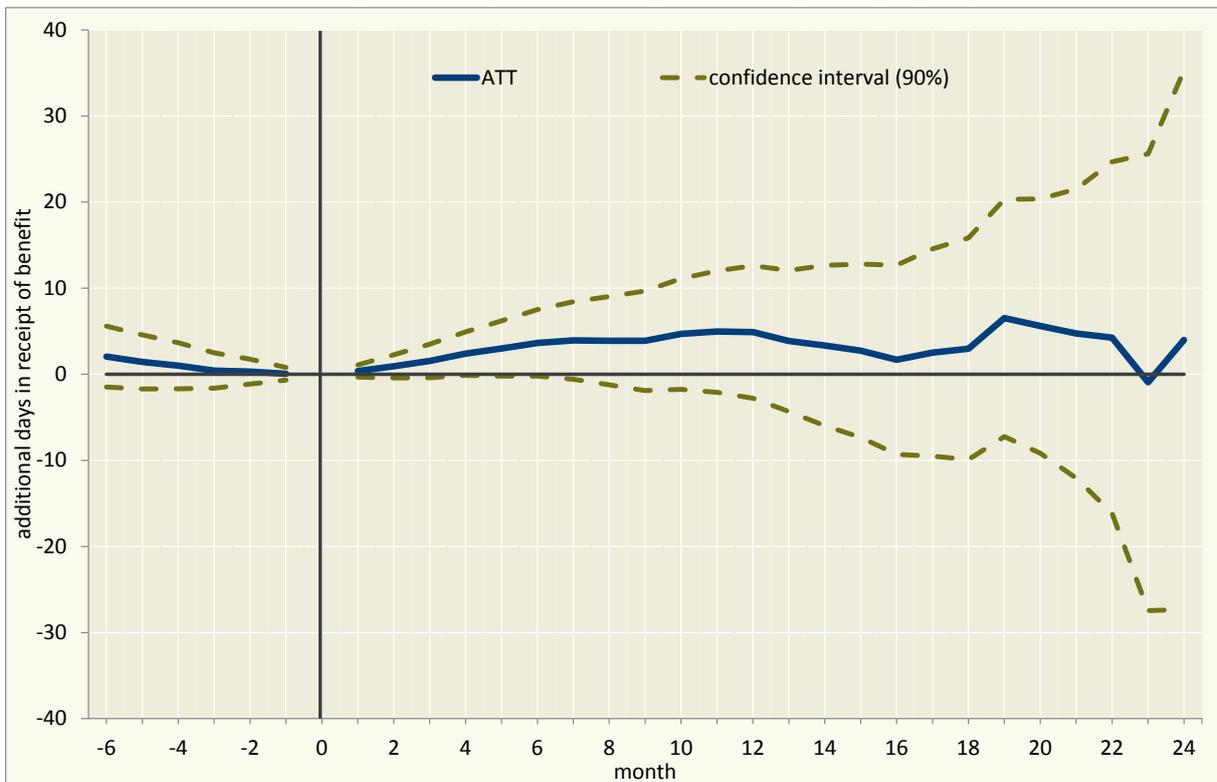
¹³ It is crucial here to control for the previous wage in great detail: in contrast to the other estimates, it is also necessary here for the control person's average earnings in the three months prior to the potential start of guidance to be in exactly the same € 250 group as that of the guidance participant. Without this criterion an estimated effect of the guidance would already amount to -€ 150 in the months before the start of guidance.

Figure 17: Wage effect (change in monthly earnings, in euros) with selection correction for the probability of working – employed persons



Source: IEB, own calculation and representation.

Figure 18: Additional days in receipt of benefit (cumulative) – employed persons



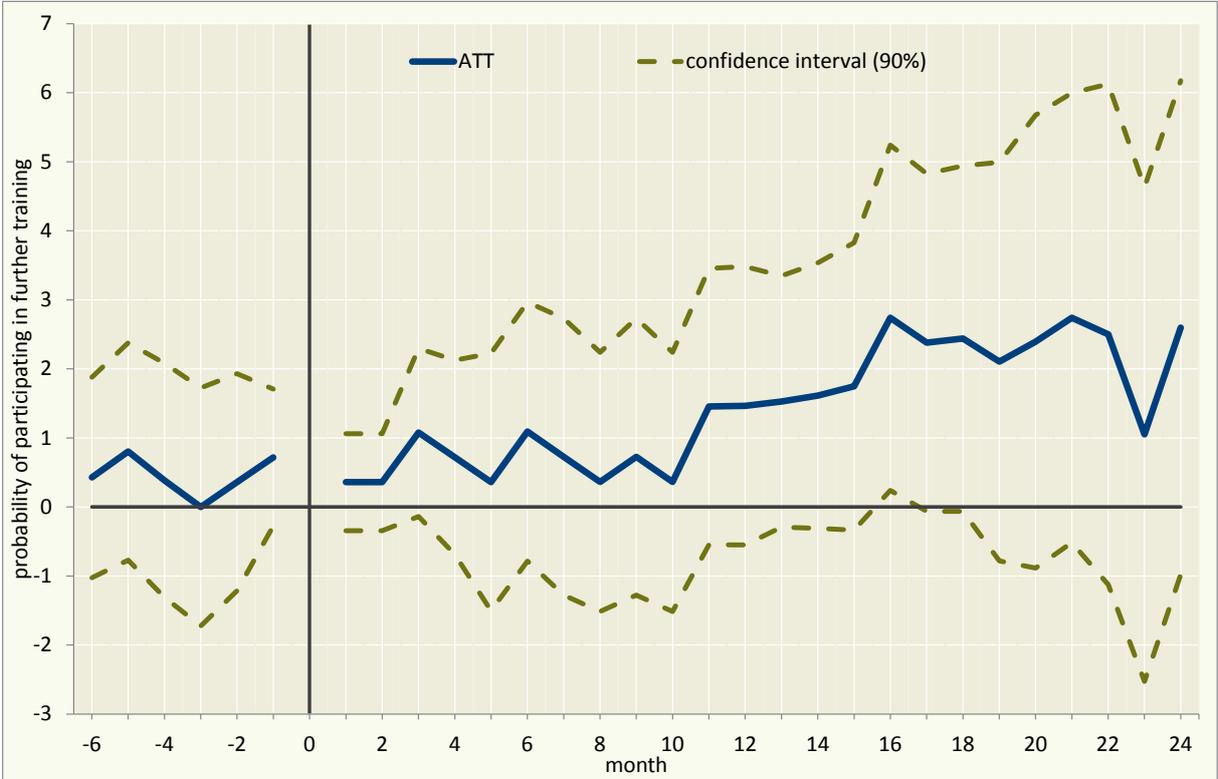
Source: IEB, own calculation and representation.

Regarding the receipt of benefits no significant increase was observed for people in employment (see Figure 18), in contrast to those not in employment. The magnitude of the average effect is negligible, at five additional days after 12 months, and even later on exceeding these five days of additional benefit receipt only in two months. During the first twelve months the size of the effect is similar to that of the effect on the duration of unemployment. However, that continues to increase, whereas in the case of benefit receipt the difference between guidance participants and non-participants fluctuates around the level reached after twelve months.

6.2.3 Impact on the probability of participating in further training

Figure 19 shows the correlation between educational guidance and participation in a publicly funded further training measure. The average treatment effect on the treated is close to zero for guidance participants who were in employment when guidance began; it is significantly positive in only one of the 24 months after the start of guidance. The reason for this is that publicly funded labour market schemes are aimed at people who have been unemployed (or in receipt of benefits) for a certain length of time. The further training measures observed here were not available for a considerable proportion of the guidance participants who were in employment. The majority of the further training courses that are possible for people in employment are not recorded in the administrative data that are processed for the IEB.

Figure 19: Increase in the probability (in percentage points) of participating in a publicly funded further training measure – employed persons



Source: IEB, own calculation and representation.

6.3 Outlook for a cost-benefit analysis

In order to assess the efficiency of educational guidance, the costs and benefits for each guidance participant are to be compared and the results for all the participants added up for all points in time after the guidance. In particular the labour-market-related costs and returns generated by the guidance per participant are assessed as a measure of the cost-benefit ratio – the average costs of the guidance scheme itself can be gathered from the budget of the municipality of Dresden. Effects on personal satisfaction, physical and mental well-being etc. that cannot be evaluated in monetary terms or are difficult to evaluate are very likely to exist but cannot be recorded here.

The three fundamental components that can be used to derive a monetary return are

- the sum of the effects on monthly earnings until the evaluation date,
- the effect on employment (in days) * mean wage of participants (per month) * 12/365,
- the effect on benefit receipt (in days) * proxy for the level of monthly benefit receipt * 12/365

It should be noted that the first two effects also influence social security contributions. To calculate the overall effect resulting from this, about 20 % of the contributions paid by the employer would have to be added to the components.

The average earnings of an employed guidance participant at the time of the guidance was € 957,90. The full rate of unemployment benefit II of € 364 in 2011 is used as a proxy for the level of benefit receipt for the unemployed (the amount of benefit received will presumably be lower than the subsistence minimum as a large proportion of the potentially unemployed persons are not needy in the sense of Social Code Book II). In the case of those who were in employment at the time of the guidance 60 % of the average earnings is used in the calculation for the first 12 months and after that also the rate of unemployment benefit II. Table 1 shows a monetary evaluation of the effects 12, 18 and 24 months after the start of the educational guidance. The components whose underlying effects are significant are shown in bold type. A negative sign means a negative return or a cost surplus.

The effect on benefit receipt for the unemployed after 12 and 18 months are the only monetary variables whose components are statistically significant as regards the sign with a 90-percent probability. The strongest monetary effects result from wage reductions that a person receiving educational guidance has to accept initially. However, the wage effect for the unemployed probably provides the best indication: towards the end of the observation period (or presumably after completing many further training courses) the guidance participants' earnings increase more strongly than those of the control group, with the result that the aggregate wage losses are smaller after 24 months than after 18 months.

Table 1: Monetary evaluation of the effects

		12 months	18 months	24 months
Wage effect	Unemployed	-502.99 €	-1,081.58 €	-798.94 €
Employment effect		138.31 €	37.65 €	-173.73 €
Effect on benefit receipt		-165.98 €	-288.77 €	-213.31 €
Effect on non-wage labour costs		-72.94 €	-208.79 €	-194.54 €
<i>Overall</i>		<i>-603.60 €</i>	<i>-1,541.49 €</i>	<i>-1,380.53 €</i>
Wage effect	Employed	-532.52 €	-1,038.74 €	-1,484.95 €
Employment effect		-290.53 €	-836.38 €	-885.26 €
Effect on benefit receipt		-92.74 €	-69.66 €	-81.65 €
Effect on non-wage labour costs		-164.61 €	-375.02 €	-474.04 €
<i>Overall</i>		<i>-1,080.40 €</i>	<i>-2,319.80 €</i>	<i>-2,925.91 €</i>

Source: own calculation.

We were able to show, however, that there is an increased participation in further training among the economically inactive guidance participants over a period of at least one and a half years. This figure is probably underestimated as only further training courses funded by the Federal Employment Agency (and other bodies responsible for active labour market policy) were recorded. In the case of employed guidance participants, there is also very likely to be increased further training activity that cannot be measured using the IEB. A further training course undertaken while in employment will presumably take longer than a full-time further training course such as is possible for those not in employment – and therefore the investment in human activity among the employed guidance participants has probably not yet dropped back to the level of those who did not receive educational guidance.

It does not seem sensible to pass judgement on the impact of educational guidance (or even of training) and the associated costs and benefits according to the revenues, expenditure and income losses accrued as of the time horizon possible at the present time. Such an assessment would be equivalent to attempting to estimate the value of modernising a house or of obtaining a consultation regarding thermal design before the modernisation solely in terms of the costs incurred for labour and material but without including the gains that can be expected (for example due to lower heating costs). This example is intended to illustrate that it is not yet possible at the present time to make a conclusive statement about the costs and benefits of educational guidance.

7 Conclusion

In the context of the “Dresdner Bildungsbahnen” project, which was developed by the Volkshochschule Dresden and the municipality of Dresden and funded by the “Local Learning” initiative of the Federal Ministry of Education and Research, a new approach to educational management has been undergoing testing since April 2010. The aim of this study was to analyse the effectiveness of educational guidance such as that provided in the “Dresdner Bildungsbahnen” project with regard to the participants’ subsequent career trajectories. The basis for the impact analysis is a dataset that links administrative data from the “Dresdner Bildungsbahnen” project with the Integrated Employment Biographies of the Institute for Em-

ployment Research. However, this dataset currently only permits an analysis of short-term effects (up to the end of 2012).

Descriptive analyses show that the participants in educational guidance are female to a disproportionate extent, aged between 15 and 50 and well qualified (with a vocational qualification, upper secondary school leaving certificate and a vocational qualification, or a university degree). However, they also confirm that those receiving guidance are also frequently unemployed or economically inactive. When guidance participants have a job they often have below-average earnings. This indicates that the “Dresdner Bildungsbahnen” project is succeeding in addressing a target group that is targeted less by other guidance schemes (e.g. integration guidance, career’s advice, higher education advice, senior citizens’ guidance).

Viewed in the short term, the impact analysis even shows a slightly negative effect on the guidance participants’ career trajectories compared to the control group of non-participants. For most of the variables measured, statistically significant differences only exist for a very short period, if at all. Some patterns (in particular for economically inactive persons) indicate a reversal of the effects after just under two years.

For the participants who were not in employment at the start of guidance there is a very clear positive effect with regard to participation in publicly funded further training schemes. Yet this effect probably even underestimates the actual increase in further training participation as further training that is not publicly funded is not shown in the IEB data. This suggests that the guidance participants are still in the phase of increased “human capital investment activity”, which results in a lock-in effect as regards their labour market outcomes.

As it is highly likely that the returns to educational guidance or to the subsequent training measure only materialise sometime in the future, the period of up to two years after the start of guidance is far too short to be able to make a final assessment regarding the effectiveness of educational guidance. Analogous to the analysis of the long-term effects of further training measures in active labour market policy, which also only become visible after more than two years, it therefore seems appropriate to look at the same cohorts of guidance participants again in three to five years. Only then will it be possible to ascertain whether their career trajectories are improving due to the educational guidance or whether it has no effect.

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Appendix

Table A 1 shows how many individuals were assigned in which stage of the record linkage procedure, with which linkage and blocking variables and according to which criterion (or which threshold value). In order to link records with one another, notations and spellings first have to be standardised in the two records. Umlauts are written out in full (ü then becomes ue, ß becomes ss), special characters are removed, probable transposition errors and abbreviations are corrected. The surname “Müller”, for example, then becomes a “MUELLER”, “J.-S.-Bach-Straße” and “Joh.Seb.Bachstraße” each become “JOHANNSEBASTIANBACHSTRASSE”. These are then merged on the basis of their similarity. An exact match is always required for the blocking variable and records are only matched within the same block. Not all transpositions can be eliminated by pre-processing the information. The selection criterion for what is regarded as an appropriate match (so-called “true positives”) has always been the Damerau-Levenshtein distance for checking the similarity of words. The threshold value is set in such a way that in most cases a “CHRISTIAN MEYER” would be regarded as identical to a “CHRISTIAN MEIER” or a “CHRISTIAN MAYER” but not a “KRISTIAN MAYR”.

Table A 1: Record linkage

Step	Linkage	Blocking	Criterion	No. of persons assigned
1	Surname, first name	District,	Almost exact (1.8) + exact date of birth	526
2	Surname, first name	Gender	Almost exact (1.8) + exact date of birth	177
3	Surname, initial	Gender, district	Almost exact (1.9) + exact date of birth	5
4	Surname, initial	Gender, year of birth	Exact (2.0) + exact date of birth	175

Source: IEB, address data of the BA statistics department, KES Dresden. Own calculations.

Table A 2: Overview of evaluation studies on publicly funded further training measures

Study	Target variables	Short-term measure	Medium-term measure	Long-term measure
Bernhard/ Kruppe 2012 (Entries into subsidised further vocational training in eastern and western Germany in early 2005)	Share of employment (also by gender, ethnic group etc.) Share of means-tested unemployment benefit recipients	after 6 mths.: (-), 12 mths.: "+", 24 mths.: "+", 28 mths.: "+" after 6 mths.: "+", 12 mths.: "-", 24 mths.: "-", 30 mths.: "-"	after 6 mths.: "-", 12 mths.: "-", 24 mths.: "-", 28 mths.: "+ after 6 mths.: "+", 12 mths.: "+", 24 mths.: "+", 30 mths.: (-)	
Biewen/ Fitzenberger/ Osikominu/ Paul 2014 (sample of individuals who became unemployed in western Germany between 02/2000 and 01/2002)	Employment effects (also by gender, duration of unemployment at entry to measure) Earnings effects (also by gender, duration of unemployment at entry to measure)	evaluated after 24 months: "+" (results for individual groups n.s. in some cases) evaluated after 24 months: "+" (results for individual groups n.s. in some cases)	after 12 mths.: "-"; after 24 mths.: "+" (results for individuals groups n.s. in some cases) after 12 mths.: "-"; after 24 mths.: "+" (results for individuals groups n.s. in some cases)	
Fitzenberger/ Orlanski/ Osikominu/ Paul 2012 (sample of individuals who became unemployed in western Germany between 01/1980 and 01/1991 and between 01/2000 and 06/2001, evaluation refers to measures that took place between 01/1980 and 12/1992 and between 01/2000 and 06/2003)	Employment effects (analysed for different groups, e.g., gender, duration of unemployment at entry to measure) Earnings effects Participation in longer training programmes (analysed for different groups, e.g., gender, duration of unemployment at entry to measure)	Measures in 2000-2003 after 6 mths.: (-), after 12 mths.: "+", after 24 mths.: "+"; Measures in 1980-1992 after 6 mths.: "-", after 12 mths.: (+), after 24 mths.: (+), after 48 mths.: "+" "similar to employment effects" Measures in 2000-2003 after 6 mths.: "+" (results for individual groups n.s. in some cases), after 12 mths.: "+" (results for individual groups n.s. in some cases), after 24 mths.: "+"; measures in 1980-1992 after 6 mths.: "+", after 12 mths.: "+", after 24 mths.: "+", after 48 mths.: "+"		
Fitzenberger/ Osikominu/ Völter 2008 (sample of individuals who became unemployed in western Germany in 1986/87 and 1993/94)	Impact on employment prospects	after 0-<1 year: "-", after 1-3 years: "+", after 4-6 years: "+"	after 0-<1 year: "-", after 1-3 years: "+", after 4-6 years: "+",	
Fitzenberger/ Speckesser 2005 (sample of individuals who became unemployed in western and eastern Germany in 1993 and have drawn unemployment benefit	Impact on employment prospects	western Germany – evaluated after 12 mths.: "+", after 24 mths.: "+", after 36 mths.: "+" / eastern Germany – evaluated after 12		

Study	Target variables	Short-term measure	Medium-term measure	Long-term measure
since 1993)		mths.: "-", after 24 mths.: "+", after 36 mths.: "+"		
Fitzenberger/ Völter 2007 (sample of individuals who became unemployed in eastern Germany (without Berlin) in 1993/1994)	Employment effects	PF evaluated after 2.5 years (6 quarters): "-", later effects "n.s.", SPST evaluated after 2 years (4 quarters): "-", then: "+"	hardly any significant results	
	Effects on number of unemployment benefit recipients	PF evaluated after 2.5 years (6 quarters): "+", later effects "n.s.", SPST effects similar to PF	Results similar to PF and SPST	
Hujer/ Thomsen/ Zeiss 2006	"Transition rate into regular employment"	evaluated after 3 mths.: "-", after 6 mths.: "-", after 12 mths.: "-"		
Lechner/ Miquel/ Wunsch 2007 (sample of individuals who became unemployed in eastern Germany between 1993 and 1994 and participated in a measure)	Employment effect	evaluated after 8 years , short-term: "+", long-term: (-)	evaluated after 8 years : "+"	
	Unemployment	evaluated after 8 years , short-term: (+), long-term: "+"	evaluated after 8 years : (-)	
	Earnings effects	evaluated after 8 years , short-term: "+", long-term: "+"	evaluated after 8 years : (+)	
Lechner/ Miquel/ Wunsch 2011 (sample of individuals who became unemployed in western Germany between 01/1992 and 06/1994)	Employment effect	evaluated after 8 years : practice firms: "+", short-term: "+", long-term: "+"	evaluated after 8 years : "+"	
	Earnings effects	evaluated after 8 years : practice firms: "+", short-term: "+", long-term: "+"	evaluated after 8 years : "+"	
Osikominu 2013 (sample of individuals who became unemployed in western Germany between 07/1999 and 12/2001)	Temporal effect on entry into employment	evaluated after <1 since start of program : "+", later: "0"; evaluated after <1 since end of program : "+", later: "0"	evaluated 220 days after start of program : "-", later: "+", evaluated up to 1 year after end of program : "+"	
	Stability of employment	evaluated 1825 days after taking up employment : "+"	evaluated 1825 days after taking up employment : "+"	
	Earnings effects	evaluated after 1 year : "n.s."	evaluated after 1 year: "+"	

Study	Target variables	Short-term measure	Medium-term measure	Long-term measure
Schneider et al. 2007 (update and further development of the estimates presented in the 2005 report, evaluation now conducted up to 48 months after start of measure). Short-term measures: occupation-related or cross-occupation FT (1), occupation-specific practical FT (2), transition institution (3). Medium-length measures: other further training not leading to a qualification (4). Long measures: individual measure leading to a qualification in a recognised occupation (5), group-based measure leading to a qualification in a recognised occupation (6)	Employment probability	evaluated after 48 mths. : (1) and (2): "+" (slightly positive), (3): no change	evaluated after 48 mths. : "-" (slightly negative)	evaluated after 48 mths. : (5) and (6): "+"
	Unemployment probability	evaluated after 48 mths. : (1) and (2): no change, (3): "+" (slightly higher)	evaluated after 48 mths. : "+"	evaluated after 48 mths. : (5) and (6): "-"
	Benefit receipt probability	evaluated after 48 mths. : (1), (2) and (3): no change	evaluated after 48 mths. : "+"	evaluated after 48 mths. : (5): "-" (slightly lower) and (6): "-"
	Probability of continued unemployment	evaluated after 48 mths. : (1): "-", (2) and (3): no change	evaluated after 48 mths. : "+" (slightly higher)	evaluated after 48 mths. : (5): "-", and (6): no change
	Employment probability	evaluated after 18 mths. : (1) and (2): "+", (3): "+" (slightly positive)	evaluated after 18 mths. : "+" (slightly positive)	evaluated after 18 mths. : (5): no change, (6): "-"
	Unemployment probability	evaluated after 18 mths. : (1), (2) and (3): "-" (slightly lower)	evaluated after 18 mths. : "-" (slightly lower)	evaluated after 18 mths. : (5): "+" (slightly higher), (6): "+"
	Benefit receipt probability	evaluated after 18 mths. : (1), (2) and (3): "-" (slightly lower)	evaluated after 18 mths. : "-" (slightly lower)	evaluated after 18 mths. : (5) and (6): "+"
	Probability of continued unemployment	evaluated after 18 mths. : (1), (2) and (3): "-"	evaluated after 18 mths. : "-" (slightly lower)	evaluated after 18 mths. : (5): no change, (6): "+"

Short measures (unless specified otherwise): "further vocational training" (divided into "practice firms (PF)" and "provision of specific professional skills/techniques (SPST)") – medium-length measures: "retraining" (RT).

Source: own compilation.

Table A 3: Results of the participation equations (parameters of the probit estimates)

Explanatory variable	Economically inactive persons			Employed persons		
	coefficient	std. error	t-statistic	coefficient	std. error	t-statistic
Female	0.2993	0.0462	6.48	0.1886	0.0442	4.27
Aged 25-29	0.3114	0.0812	3.84	0.2253	0.0681	3.31
Aged 30-34	0.4272	0.0823	5.19	0.2624	0.0714	3.67
Aged 35-39	0.4806	0.0882	5.45	0.2176	0.0797	2.73
Aged 40-44	0.3275	0.0933	3.51	0.2246	0.0802	2.8
Aged 45-49	0.1962	0.0984	1.99	0.1288	0.0838	1.54
Voc. qual., no upper secondary cert.	0.2054	0.2603	0.79	0.4146	0.2138	1.94
No voc. qual., upper secondary cert.	-0.0071	0.4279	-0.02	0.3190	0.2386	1.34
Voc. qual. + upper secondary cert.	0.2892	0.2648	1.09	0.4619	0.2174	2.12
Degree from univ. of appl. sciences	0.3160	0.3222	0.98	0.4722	0.2443	1.93
University degree	0.4575	0.2647	1.73	0.4968	0.2188	2.27
No. days unemployed, last 3 months	0.0026	0.0009	2.88	0.0016	0.0016	1.01
No. days unemployed, last 12 mths.	0.0001	0.0003	0.43	0.0004	0.0005	0.79
No. days benefit receipt, last 3 mths.	-0.0032	0.0015	-2.13	-0.0016	0.0022	-0.72
No. days benefit receipt, last 12ths.	0.0008	0.0004	1.79	0.0005	0.0006	0.9
No. days in employment, last 3 mths.	0.0020	0.0014	1.45	-0.0016	0.0014	-1.19
No. days in emp., last 12 mths.	-0.0001	0.0003	-0.47	0.0000	0.0003	-0.09
Cumulative duration unemployment	-0.0001	0.0001	-1.66	-0.0002	0.0001	-1.85
Cumulative duration benefit receipt	0.0001	0.0000	1.21	0.0002	0.0000	3.34
Cumulative duration further training	-0.0170	0.0082	-2.08	-0.0057	0.0123	-0.47
Cumulative duration break from emp.	-0.0001	0.0002	-0.57	-0.0003	0.0005	-0.63
# Jobs: 2	-0.0235	0.0719	-0.33	-0.0566	0.0615	-0.92
# Jobs: 3	-0.0390	0.0816	-0.48	-0.0660	0.0704	-0.94
# Jobs: 4	0.0833	0.0908	0.92	-0.0003	0.0767	0
# Jobs: 5	-0.0190	0.1081	-0.18	-0.0332	0.0909	-0.37
# Jobs: 6	0.1001	0.1192	0.84	0.0314	0.1032	0.3
# Jobs: 7	-0.0336	0.1553	-0.22	-0.0395	0.1287	-0.31
# Jobs: > 7	0.2037	0.1287	1.58	0.1540	0.1074	1.43
# Occupations: 2	-0.0055	0.0689	-0.08	-0.1020	0.0560	-1.82
# Occupations: 3	0.1173	0.0758	1.55	-0.0401	0.0659	-0.61
# Occupations: 4	-0.1276	0.1021	-1.25	-0.1032	0.0812	-1.27
# Occupations: 5	0.0640	0.1116	0.57	-0.0972	0.0979	-0.99
# Occupations: 6	0.0368	0.1414	0.26	-0.2644	0.1392	-1.9
# Occupations: 7	-0.1041	0.1915	-0.54	-0.0931	0.1478	-0.63
# Occupations: > 7	-0.0009	0.1720	0	-0.0600	0.1413	-0.42
Unknown	-0.3380	0.0917	-3.69	-0.1801	0.1096	-1.64
Low-grade manual occ's/ agr. occ's	-0.0893	0.0772	-1.16	-0.2059	0.0802	-2.57
Skilled manual occupations	-0.2447	0.0895	-2.73	-0.2267	0.0851	-2.66
Technicians/engineers	-0.3319	0.1342	-2.47	-0.0825	0.0922	-0.89
Low-grade service occupations	-0.0929	0.0744	-1.25	-0.0929	0.0671	-1.38
Skilled service occupations	-0.3612	0.1341	-2.69	-0.2225	0.0920	-2.42
Semiprofessions	-0.0803	0.1007	-0.8	0.0279	0.0695	0.4
Professions	-0.3162	0.1176	-2.69	-0.2353	0.1135	-2.07
Low-grade comm. and admin. occ's	-0.0545	0.0805	-0.68	-0.2099	0.0766	-2.74
Managers	-0.0234	0.1372	-0.17	-0.1045	0.1227	-0.85
Gross monthly wage				-0.0002	0.0000	-7.41
Unemployed in next 3 months				0.2215	0.0567	3.91
Constant	-2.8869	0.2758	-10.47	-2.9421	0.2413	-12.2

Sources: IEB, KES Dresden; own calculations.