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The outcome of coaching and training for self-employment

A statistical evaluation of non-financial support schemes for unemployed business founders in Germany

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Abstract

This paper focuses on the question of whether improving the competence of new business founders by means of coaching and training programs enhances the duration of self-employment. In our analysis we focus on support activities that are provided in addition to a financial subsidy and which mainly focus on providing external expertise for founders who started a business from a position of unemployment. We find that the inflow into the related schemes is strongly determined by regional patterns and time while individual characteristics are less important. This reflects a particular regional specialization in the set-up of the promotion of self-employment. A statistical matching approach is used to control for selectivity and is performed in a way that explicitly takes into account differences across regions and over time. The results show that treatment effects tend to be insignificant in statistical and economic terms. We also find evidence that external expertise reduces the duration of self-employment.

Zusammenfassung

Die vorliegende Arbeit beschäftigt sich mit der Frage ob Maßnahmen mit dem Ziel einer Verbesserung der Qualifikation von Gründern zu einer Erhöhung der Erfolgschancen von Gründungsprojekten führen. Untersucht werden nicht-finanzielle Förderinstrumente bei Gründungen aus der Arbeitslosigkeit. Deutschland hat hier in den letzten Jahren zahlreiche neue Instrumente geschaffen, die unter anderem an der Qualifikation der Gründer in der Vor- und der frühen Nachgründungsphase ansetzen. In der Untersuchung zeigen sich starke regionale Unterschiede in der Eintrittswahrscheinlichkeit – in zahlreichen Regionen finden sich sogar gar keine Fördereintritte. Dies deutet bei der Vergabe von Förderleistungen der ergänzenden Gründungsförderung auf eine sehr hohe Bedeutung regional spezialisierter Förderstrategien hin. Bei den Vergleichsanalysen werden diese Besonderheiten im statistischen Matchingansatz berücksichtigt. Die Ergebnisse zeigen, dass unabhängig von der Modellspezifikation, Stichprobeneinschränkungen und Art der Erfolgsmessung, im Aggregat keine statistisch signifikanten Effekte bei der ergänzenden und qualifikationsspezifisch ausgerichteten Gründungsförderung erwartet werden können.

1 Introduction

Self-employed individuals and entrepreneurs are often considered to be key elements in political strategies to increase economic development and to stimulate employment dynamics. In the past decade politicians have identified that not only limited capital but also a lack of qualifications and deficits in expertise constitute major constraints in promoting self-employment (e.g. Cressy 1996). In this context a special initiative has been set up that has shifted common self-employment promotion practices from focusing on loans and subsidies as the major methods of support to a more integrated promotion policy. For example, the European Employment Strategy (EES) and the OECD intervention plans worked in this direction and promoted the establishment of advisory support schemes that operate alongside financial support programs.

So far, related research indicates that promotion activities involving advisory support (likewise: non-financial support) have different effects in enhancing entrepreneurship. For example Shutt/Sutherland (2003) do not find a significant effect of advisory support schemes (coaching schemes) on the survival chances of founded businesses in England. Similarly, Eckl et al. (2009) report that advisory support does not improve firm growth when focusing on ESF co-funded start-ups in Germany. However, experience related to the US program of the "Small Business Development Center" (SBDC) indicates that the intensity and the quantity of advisory services can have a positive effect on firm growth and sales development (Chrisman et al. 2005; Chrisman/McMullan 2000). Similar evidence is also found for the English Business-Link-Network scheme (Mole et al. 2008). Findings on heterogeneous treatment effects of support programs are reported by Parker/Belghitar (2006), who find evidence of quality effects of the corresponding schemes (provider effects). Furthermore, the findings obtained by Wren/Storey (2002) also indicate that assistance schemes seem to be more effective for medium-sized business start-ups. Finally, focusing on the experiences made in the SBDC program, treatment effects may also differ depending the start-up period when the support scheme actually begins (e.g. Chrisman 1999; Chrisman/Leslie 1989).

However, when evaluating the outcome of 'non-financial' support programs in terms of survival chances we must be aware that theoretically external expertise may always be a two-sided coin with regard to its effects on self-employment stability. More precisely, from a theoretical perspective expertise is ambiguous as regards its effects on survival chances because it not only improves productivity but also enhances learning (Jovanovic 1982; Ericson/Pakes 1995). External expertise may therefore also lead to more precise evaluations of business prospects, which may foster exits and can thus also, have the opposite effects to those expected by the politicians (see for example LeBrasseur et al. 2003; Gastrogiovanni 1996; Shane 2000).

It therefore remains important to obtain further information about specific programs in order to validate and extend earlier research. To be more precise, information about the particular set-up of the programs and the way they focus on including external expertise is still limited. Furthermore, little is known about the contribution of these programs to the sustainability (long-term survival chances) of the newly founded businesses. Finally, from the methodological point of view limitations still exist when controlling for heterogeneous treatment effects.

In this study we extend the existing research and focus in particular on programs that were set up to promote self-employment activities among the unemployed.[1] Our research concentrates on studying the net gains from coaching and training schemes that supplement financial support. This interplay between additional support and traditional funding has yet not been studied in the context of self-employment promotion - and only little is known about the outcome of advisory support schemes in order to promote entrepreneurship activities among the unemployed. Furthermore, we apply accurate microeconomic evaluation techniques and - in contrast to earlier research - we focus on the effect on the duration of self-employment.

With regard to our evaluation approach we follow a broad strand of recent evaluation studies in labor market research and control for endogeneity and selectivity by using a statistical matching approach (e.g. Lorentzen/Dahl 2005; Wunsch/Lechner 2008; Hujer et al. 2004; Almus/Czarnitzki 2003; Baumgaertner/Caliendo 2008; Caliendo/Kritikos 2009). Furthermore, we take into particular consideration the fact that 'non-financial' support programs are also specifically embedded in the institutional framework of regional policy strategies. With this in mind we adapt the standard evaluation approach and pay extra attention to regionalized implementation. Hence, in our approach we use a clustering framework which ensures a specific weighting scheme in the matching procedure.

The population we concentrate on consists of recipients of the so-called *bridging allowance* (*"Überbrückungsgeld"*, a financial benefit to encourage transitions from unemployment into self-employment), for whom we identify participation in *training*, *coaching* and *discretionary start-up support* for self-employment. As a consequence, in this study treatment is defined as receiving additional 'non-financial' support in conjunction with the *bridging allowance*. The data we use are the IEB (Integrated Employment Biographies), which are compiled by the Institute for Employment Research of the German Federal Employment Agency. This data set consists of information from four distinct administrative registers and combines employment biogra-

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[1] E.g. focusing on Germany we find that promoting self-employment among the unemployed (only taking into account those who receive financial support) has increased substantially in the last decade and rose to almost 25 % of all new self-employment notifications (varying between 20 % and slightly above 30 % depending on which statistic is applied).

phies and detailed information on participation in employment and training schemes. The advantage of using these data is threefold: first, we are able to observe a five-year period to assess the program outcome, second the data rarely suffer from types of participation or attrition bias as are usually found in survey data and third, they permit a valid identification of periods of self-employment and the type of non-financial support received.

The next section describes the institutional setting of German self-employment promotion as it is implemented in active labor market policy. Section three presents the data set and describes the construction of the analysis sample. Part four of the study contains the analysis, which includes the evaluation strategy, descriptive information, discussion of the selection process and the implementation of the matching strategy. Part five presents and discusses the empirical results. Finally, section six summarizes the study, makes some concluding policy-related remarks and some suggestions for future research.

2 Promotion of self-employment as part of active labor market policy

The basic framework of the promotion of self-employment since the late 1990s
Active labor market policy is a combination of employment and training schemes that are offered to unemployed people in order to enhance their chances of re-employment.[2] In Germany, the majority of these schemes are run by the Federal Employment Agency (Bundesagentur für Arbeit) and they are generally highly standardized with respect to access and scope (executive directives: treatment assignments, application forms, topics). Usually there is little freedom in managing access to and concerning the subjects of the instruments of active labor market policy. However, in some cases the promotion of self-employment promotion has become a specific exception in this context.

The field of self-employment promotion in active labor market policy was first addressed in 1986 in the form of a financial subsidy to support the transition from unemployment to self-employment (known as *"Überbrückungsgeld"*: *bridging allowance*). During the mid-1990s the promotion of self-employment was pushed ahead due to a more generous use of the *bridging allowance*. In the late 1990s the promotion of self-employment was expanded. First of all, the coming into force of the Social Code Book III (SGB III) in 1998 led to a greater degree of managerial disposition for the local employment offices based on §10 SGB III (discretionary measures of regional active labor market policy administered by the local employment agencies (*freie Förderung*)). To a large extent this greater degree of freedom was used to increase the promotion of self-employment at local level. Second, in 1998 the active labor market policy of the Federal Employment Agency also implemented a nation-

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[2] For a more general overview see for example Eichhorst/Konle-Seidl (2006).

wide program as part of the national ESF funding (known as the *ESF-BA-program*; before 2000: *AFG-Plus*; see Deeke 2005). Initially, the national ESF funding focused on promoting training schemes in general such as for instance supporting further training or short term training courses. However, during the promotion period between 1998 and 2006 this shifted towards promotion consisting mainly of additional support to encourage self-employment.

Finally, important developments in the promotion of self-employment were made in 2003, when a second benefit was introduced parallel to the *bridging allowance*. This new *business start-up allowance* ("*Existenzgründungszuschuss*") focused especially on the long-term unemployed and on individuals who had worked part-time before becoming unemployed. In 2006 these two subsidies (*bridging allowance* and *business start-up allowance*) were combined to form a new form of self-employment promotion. [3]

Characteristics of the schemes to promote self-employment[4]
When reviewing the promotion of self-employment, the most important scheme in the late 1990s and the early 2000s was the *bridging allowance*. As mentioned above, this scheme mainly took the form of financial support. Since it is offered by the German Federal Employment Agency access to the program is limited to the population of individuals who are unemployed or are threatened by unemployment and who seek to avoid unemployment by becoming self-employed. The aim of this scheme was to reduce the barriers to entering self-employment by ensuring coverage of living expenses. The bridging allowance was paid at the same level as unemployment benefit and also covered the social security contributions for the first six months of the new business activity. Access to this program was open to those who were entitled to unemployment benefits but only in cases in which the new venture would enable the individual to leave unemployment and if the business concept was assessed positively by a competent authority (e.g. a local chamber of commerce).

The discretionary measures of regional active labor market policy administered by the local employment agencies under Social Code Book III, § 10 ("*Freie Förderung*", hereafter 'discretionary measures') are fairly heterogeneous in terms of regulation and topics and focus mainly on enhancing local strategies to combat unemployment. In general, the discretionary measures cover schemes that go beyond the standardized employment promotion programs of the Social Code III, for instance concentrating on special industries or target groups and permitting specific regional problems to be addressed. Over time this source of funding has increasingly been used to promote self-employment, which has resulted in the promotion of local entrepreneurship centers, financial subsidies and/or training schemes for nascent entrepre-

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[3]   For details of the changes in the general setting see Fleckenstein (2008) - with respect to the promotion of self-employment see Caliendo/Kritikos (2009).

[4]   Table A1 in the appendix provides a detailed overview of the promotion schemes which are of interest in this study.

neurs. Unfortunately, for practical reasons there was a relatively high level of aggregation in the reporting system on related programs (so called "discretionary *start-up support*" (DSUS)) so that additional information about the promotion programs is very limited. However, interviews with local authorities showed that it is plausible to assume that "*discretionary start-up support*" - if used as additional support - comprises types of support that we would typically define as non-financial (see footnote 4).

Finally, according to the ESF-BA-Program *training* and *coaching* for *self-employment* were initially implemented in line with the EES, which focused on enhancing the culture of self-employment in general and also aimed to improve the individual's ability to start a new business. While the coaching scheme ran until the end of the program in 2008, the *training for self-employment* was replaced due to another legal form of promoting training schemes in 2003. Conceptually, *training courses* and *coaching* were based on an integrated sequence of promoting self-employment. However, in practice the two programs were often offered without requiring this sequence. In detail: *training courses* were aimed mainly at enhancing preparatory skills (in courses lasting between 4 and 12 weeks) while *coaching* was organized as a way to ensure qualified assistance during the first year of the start-up period. Both schemes covered all direct expenses (course fees or the payments for the coach) as well as indirect costs for childcare, accommodation and travel (up to a maximum of 4600 Euros). Unfortunately, detailed information about the topics and the organization of the courses is limited.[5]

3   Data and sampling

The data used for the analysis are a sample of the Integrated Employment Biographies (IEB). These data are compiled from four administrative sources that originate from the registers of the Federal Employment Service.[6] The data include employment and benefit histories dating back to 1990 as well as official registrations for job search, periods of unemployment and participation in active labor market programs dating back to 2000. By combining these sources the IEB allows a detailed historical perspective of periods of employment and unemployment.

The information provides the exact start and end dates of each period. Source-specific information adds data about the individual's schooling, the type of employment, job characteristics, income and detailed information about qualifications. In addition, we added data from the Establishment History Panel (Betriebs-Historik-Panel – BHP), see Spengler (2008), to include characteristics of the corresponding

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[5]   To gain a deeper insight into the scheme we collected information concerning topics, duration and quality in additional interviews with participants and local authorities. Among other things the survey does not substantiate the claim that the training and coaching are of poor quality. For details see Oberschachtsiek (2007).

[6]   These data cover almost 80 % of all employed individuals (mainly excluding the self-employed and civil servants) in Germany and all jobs that are covered by social security.

employment episodes, and regional labor market information.[7] In the latter case we added data from the official statistics of the Federal Employment Agency. For a detailed overview of the attributes see Table A2 in the appendix.

For the analysis these data were cleansed in several ways. First of all, to emphasize the context of 'additional support', we restrict the analysis to individuals who received the *bridging allowance*. This ensures a valid identification of self-employment periods. Furthermore, start-ups after the first quarter of 2003 (hereafter, 2003(I)) are not studied because they may be affected by additional institutional changes that were introduced in 2003. Drop-outs and episodes for which it is difficult to identify valid start or end dates are removed from the analysis.[8] Moreover, in order to focus only on valid additional 'non-financial' support the study is also restricted to cases of support which lie within a certain time corridor before and after receipt of the *bridging allowance*.[9] Detailed information on the cleansing procedures is available from the author.

As the aim of this study is to analyze the outcome of 'non-financial' support we apply a simple treatment-effect approach where we study the effect of intervention on a related outcome that we expect to be affected by the treatment. The treatment in our case is defined as additional 'non-financial' support - that is participating in a single additional support scheme based on *training or coaching* for self-employment or on *discretionary start-up support*. Multiple treatments like combining *training* and *coaching* for self-employment are not studied.[10] For the comparison group we use individuals with no additional 'non-financial' support. This includes all individuals who never received extra support during the time period and those who did not receive valid additional support but who received a *bridging allowance*.[11]

As noted above, the outcome measure relates to the major political objective of self-employment promotion and is intended to capture the stability of an individual's pe-

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[7] The local information focuses on the level of labor market districts, as suggested in Arntz/ Wilke (2009) and Oberschachtsiek (2010).

[8] For the same reasons people with more than three records of bridging allowance between 1999 and 2005 are excluded from the sample. This excludes episodes of bridging allowance lasting less than 60 or more than 740 days. In cases where there are two or three records of bridging allowance, the study uses the first observation as the reference.

[9] The definitions of the time windows take legal regulations and empirical density into account. For example when focusing on coaching, additional support will only be valid if the entry lies within one year after but not more than three months before entering self-employment. A training episode is only taken in account if the self-employment entry lies within a period of one year after finishing the training course. For cases of discretionary start-up support we allow the start date to lie within a time window of one year before or after the start date of the bridging allowance. For a detailed description see Figure A.1 in the appendix.

[10] Studying multiple treatments would also run into methodological problems because of limited observations.

[11] Alternatively we might omit these observations. However, such a restriction could also bias the investigation because invalid treatments may relate to re-starters and lead to an underrepresentation of unsuccessful cases.

riod of self-employment. Unfortunately, the data do not provide a direct measure of this, so we used an inverse definition in which instability is approximated by any record that is not related to the promotion of self-employment after entry into self-employment. We regard this as any records of unemployment, employment or job-search after the individual had begun receipt of *bridging allowance* (exits from self-employment). Furthermore, we concentrate on the duration of self-employment and allow for different types of exits from self-employment (exits into unemployment and into employment), which may provide further information about the economic reasons for quitting self-employment.

4 Analysis

The evaluation strategy

To assess the effects of these schemes on the duration of self-employment we use a comparison framework in which the populations of individuals with and without policy intervention are used to identify counterfactual observations for the estimation of average treatment effects.[12] The core idea of this approach focuses on rebuilding an experimental design in which an attempt is made to impute counterfactual observations by matching treated and untreated observations with similar (identical) characteristics. Following Rosenbaum/Rubin (1983) using sufficiently good matches as the counterfactuals the treatment assignment can be regarded as random, which ensures that the potential outcome would be independent of the treatment assignment (Conditional Independence Assumption; CIA).

Compared to other methods the advantage of matching is that the set of necessary restrictions is highly limited (e.g. it does not need the exogeneity of conditioning variables, exclusion restrictions or the separability of outcome and choice equation). In particular, matching techniques do not require a parametric specification of the outcome function or of the selection process, but they emphasize the existence of a common support and this makes it possible to study heterogeneous treatment effects. However, the bias reduction due to matching fundamentally depends on the availability of rich information that allows the inclusion of attributes that simultaneously determine the treatment assignment and the potential outcome of the comparisons.

As in any evaluation, the identification of causal effects also relies on the absence of general equilibrium effects. This assumption is known as the stable unit treatment value assumption (SUTVA; see for example Holland 1986). The SUTVA states that the participants need to be stochastically independent across all observations and that the outcome must be independent of the mechanism by which the participant receives the treatment. In more practical terms this implies that an individual's potential outcome and his or her likelihood of receiving a treatment should not interfere

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[12] For a deeper discussion see for example Heckman et al. (1997 and 1999) or Blundell/Costa Dias (2009).

with those of others. In our evaluation this assumption may evoke special concerns because of the regionalized policies that are studied. Usually, the validity of the SUTVA should hold in cases of a low ratio between the number of participants on the relevant labor market and the total size of that market so that interaction between the potential participants is limited (this is usually fulfilled for relatively small support schemes). To clarify this, think of an intervention, for example, that is small at national level but which may have a substantial relevance for a particular region. We therefore need a better understanding of the regional level in the selection process. If regional characteristics are important, the validity of the SUTVA will require a more local perspective, which must result in an implementation of the matching approach that takes into account the regional support context.

Distribution of participation

Observations enter the risk setting in the year 2000 and are right-censored to December 31st 2005. We find that the inflows into the bridging allowance increased from over 85,000 in 2000 to 140,671 in 2003. In total, and taking into account the sample restriction presented above, 418,856 cases of *bridging allowance* are included in this study. *Discretionary start-up support* (*DSUS*) shows the largest number of participants (n = 30,481), followed by cases of *coaching* (n = 13,737), while the number of participants in *training* courses remains relatively small (n = 2,131).

Following the discussion above and the outline of self-employment promotion in section 2 we first take a closer look at the regional variation in the relative relevance of the individual schemes. Figure 1 reports the ratio between the number of participants in an additional support scheme (*training*, *coaching* or *DSUS*: *discretionary start-up support*) and the total number of participants in receipt of the *bridging allowance* for each of the 176 local labor market districts (note: the x-axis is based on the official identifiers of the local districts).

As can be seen in Figure 1, most labor market districts have low ratios of additional support, which indicates a low importance of extra self-employment promotion. However, in some regions these extra support activities are close to or even exceed a share of 40 % (which is the case for *discretionary start-up support* and *coaching*). In contrast, *training* for self-employment remains relatively unimportant in most of the labor market districts (close to zero). Obviously, there are strong local differences either in the costs of managing the schemes or in the expected gains that may drive this regional heterogeneity.

Figure 1
The relative importance of different self-employment promotion schemes across regions
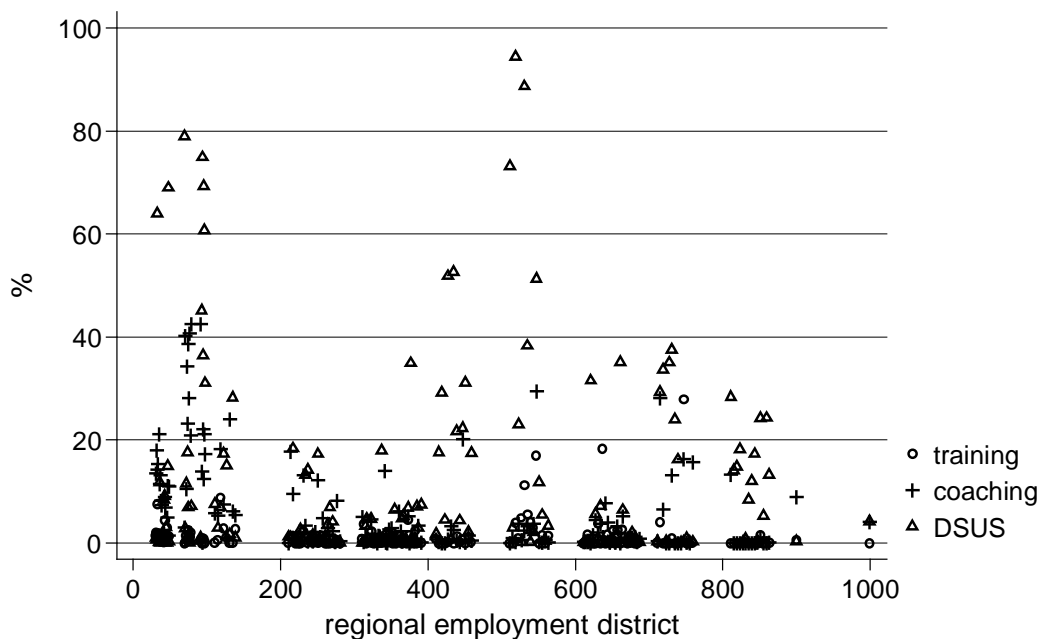
thex-axis indicates the identifier of a local labor market district
Source: IEB, own calculations

This finding is important for the evaluation because it indicates a high relevance of local implementation and particularly deviates from the picture that is usually found for other types of promotion schemes where (apart from a structural difference between eastern and western Germany) we observe a smoother distribution across regions (e.g. training schemes; see Hirschenauer 2001). This also supports the hypothesis that there is a particular regional specialization in the promotion of self-employment. Furthermore, this finding directly emphasizes the concern regarding general equilibrium effects (in regions with exposed promotion activities) and the problem of limited joint support (in regions with hardly any additional activities). To overcome this potential source of bias we exclude regions with more than 40 % of additional promotion in one of the types of additional self-employment promotion under observation. As a result 17 local labor market districts are excluded from the study. This corresponds to a loss of almost 29,700 observations (12,500 of *bridging allowance*; 3,400 *coaching* observations and 12,200 in *DSUS*). Furthermore, in the matching approach we exclude all regions that provide no support in the statistical matching approach.[13]

The selection process, potential outcome and the validity of the CIA
Treatment selection
Before beginning the evaluation we first examine the selection process to gain further insights into the treatment assignment. Theoretically, selection into an addition-

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[13]   The initial and final sample sizes are reported in A4a to A4c in the appendix.

al self-employment support scheme can be regarded as a result of negotiation between the local agent (case manager of the local employment office) and the applicant. As seen from the supply side, regional differences may result from different local policy strategies, different cost/benefit structures and perceived success that are related to the specific characteristics of the local labor market. Therefore, the supply is assumed to be driven mainly by specific local labor market conditions. Furthermore, time in this context captures variation in learning about efficient policies.

Table 1
Factors affecting treatment selection

	Training		Coaching		DSUS	
Block of variables	BIC	LR	BIC	LR	BIC	LR
model 1 (only b1)	40,459.61	1782.47***	171,601.50	7163.75***	200,113.40	1260.58***
model 2 (adding b2 to b1)	33,738.78	8204.86***	129,326.40	44134.18***	152,136.90	50014.96***
model 3 (adding b3 to model2)	33,057.17	950.84***	128,866.70	926.89***	150,720.80	1685.34***

Notes: The blocks of attributes are introduced sequentially in nested models.

The blocks of attributes contain: b1 (7 dummy variables for the # half-year of entry); b2 (regional information, 108 to 159 variables, including regional conditions and dummy variables for each local labor market district); b3 (individual information, 94-99 variables, including gender, age, qualification level, employment background and occupational background based on a two digit classification)

Note: Low values of the BIC indicate a superior statistical model: $BIC = -2 * \ln L + k * \ln(n)$

the change in the terms of the BIC is sensitive to the order in which the models are introduced – however, several checks reveal no different findings from those reported above.

Source: IEB, own calculations

In turn, selection at the individual level (the demand side) is affected by the individual's cost/benefit functions. However, since these are not directly visible to the researcher, we assume that the driving forces behind this pattern are related to individual expertise, which we presume to be linked to the individual's experience, formal qualifications and employment biography.

Focusing on the selection process, Table 1 reports some related statistics separately for each support scheme. The results are based on logit models and cover different sets of attributes. Since we are only interested in general information about the selection process, Table 1 focuses only on model fit statistics. The reported statistics (Bayesian Information Criteria [BIC] and the Likelihood Ratio [LR]) provide information about the entropy of the statistical modeling which can be used to describe the general pattern of the selection process (see for example Burnham/Anderson 2004).

As can be seen from Table 1, the greatest model improvement is gained by introducing regional characteristics (especially the introduction of an indicator for the local labor market district). This finding directly supports the hypothesis that the local

agent's cost/utility function (policy strategy) is of importance in the overall selection process. In detail, we find that additional support has a higher ratio in eastern Germany in general (less pronounced for the *discretionary start-up support*) and that time and the local composition of additional self-employment promotion strongly affect the selection process. In contrast, individual characteristics are of low informational value for explaining program participation. Nevertheless, we find that the probability of receiving additional support for self-employment increases with age (inversely U-shaped), that it is higher for males and that the likelihood rises with the qualification level.

The validity of the CIA
For the validity of the matching approach it is critical that we pay sufficient attention to information that co-instantly correlates with the treatment assignment and the outcome measure. In this context it is usually the firm's capital structure and the presence of financial constraints that are emphasized by research on start-up success. However, the research on start-ups that have been undertaken from a position of unemployment reveals a somewhat different picture (e.g. Hinz/Jungbauer-Gans 1999, Oberschachtsiek 2008).[14]

Furthermore, while we observe that selection into support schemes is strongly influenced by regional conditions, the literature on the determinants of survival emphasizes the importance of individual characteristics. In particular, previous research indicates that experience, schooling, gender and motivation are highly correlated with business prosperity and the duration of self-employment (for an overview see Santarelli/Vivarelli 2007; for business founders from a position of unemployment in Germany see Wießner 2001, Reize 2004, Caliendo/Kritikos 2009 and Oberschachtsiek 2008). Findings on the role of regional conditions mainly focus on firm formation rather than on self-employment (Fritsch et al. 2006; Falck 2007). However, both Taylor (1999) and Johansson (2000) show that the unemployment rate influences survival chances. More explicit evidence is provided by Oberschachtsiek (2010), who shows that local labor market conditions strongly affect the survival of the new business on a higher level of complexity (e.g. it differs in its effect across qualifications and is multidimensional in affecting survival chances) - even if individual characteristics are more pronounced.

All in all, in our opinion it is more important to include information related to the individual employment history and context-specific information, such as for instance information regarding the legal form of the business. In this sense we feel quite confident that the included information should provide sufficient support for the CIA. Finally, further important factor supporting the argument that sufficient information is

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[14] Both studies support the thesis that capital endowment does not seem to be a critical factor in driving the survival chances of new businesses founded by people who started their businesses from a position of unemployment. Instead both studies emphasize a higher relative importance of human capital.

included in our data is that a major issue of selection is already absorbed by the decision to apply for the bridging allowance (e.g. capturing the motivation to start a business) and due to the fact that specific data restrictions apply (see above).

Implementation of the matching procedure

In our evaluation we concentrate on the Average Treatment Effect on the Treated (*ATT*) as the most interesting parameter. This estimator is defined as the difference between the mean outcome of the treated $Y_i^{D=1}$ and the estimated counterfactual outcome $\hat{Y}_j^{D=1}$ and provides information about the net outcome of a treatment for those who were treated:

$$ATT = \sum_i \left[Y_i^{D=1} - \hat{Y}_j^{D=1} \right] \quad \text{given that} \quad \hat{Y}_j^{D=1} = \sum_j W_{i,j} Y_j^{D=0} , \tag{1}$$

where *i* characterizes the treated and *j* the untreated individuals. In our analysis all individuals that only received the bridging allowance are defined as untreated while the population of those with some form of additional promotion defines the treated individuals. As the right-hand side of Formula (1) shows, the estimated counterfactual outcome for those receiving additional support is taken from the mean outcome of the bridging allowance population with no support ($\hat{Y}_j^{D=1}$). We calculate this counterfactual outcome as the weighted mean outcome of the non-treated, in which the individual weights $W_{i,j}$ refer to the distance between comparisons *j* and *i.* To ensure the equal importance of treated and untreated observations, weights are restricted to the following conditions:

$$\sum_j W_{i,j} = 1, \quad W_{i,j} \in [0,1]. \tag{2}$$

The distance between those with and those without additional support is used to define the comparability of the comparisons. For technical reasons we use the Mahalanobis distance, which allows us to set a distance measure and which is used as a measure of equality.[15] In order to stress the importance of specific characteristics we use a more complex procedure to define this distance measure and apply this in the matching approach. For example, to permit a more detailed representation of the selection process we carry out a direct matching procedure for the type of region and calendar time and we calculate three propensity scores (see the full matching approach on the next page) which enter the distance measurement.

Finally, the weighting scheme *W* is then implemented by using a kernel function *K* (Epanechnikov kernel) based on the bandwidth *h* and the distance function *u*, where *u* is defined on the basis of the distance between the balancing scores (*B(x)*) - that

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[15] See Cochran/Rubin (1973) and Rubin (1980) for the properties of *M(x)* in matching approaches.

is the dissimilarity between the treated and the untreated observation - and the bandwidth h:[16]

$$W_{i,j} = \frac{K_{i,j}}{\sum_j K_{i,j}} \quad \text{with} \quad K_{i,j} = \frac{3}{4}(1-u^2)\, 1_{\{|u|\leq 1\}} \quad \text{and} \quad u = (B_i(x) - B_j(x))/h \quad (3)$$

When specifying our outcome measure we focus on two measures. The first is defined as the likelihood of quitting self-employment during the first 36 months ($T \leq 36$) and focuses on a cumulated outcome difference (Y^1). The second measure provides information about the time-dependent survival probability (Y^2). This is the inverse of the probability of quitting self-employment in or before a time interval (t; t') given that the individual has entered that time interval. Both measures are calculated for k types of exits: all types of exits, exits into unemployment and into employment:

$$Y^1 : \Pr(T^k \leq 36) \tag{4}$$

$$Y^2 : 1 - Pr(\, t \leq T^k < t'/T^k \geq t\,) \tag{5}$$

The full matching approach proceeds as follows:[17]

1. Identify j and i.
2. Skip regions with no support (zero participants between 2000 and 2003).
3. Estimate three propensity scores $Ps(x)$: $Pr(D=1|X^i)$, $Pr(D=1|X^{rc})$ and $Pr(D=1|X^{rd})$;[18] where $Pr(D=1|X=x) = 1 / (1 + e^{X'\beta})$.
4. Stratify the matching procedure into matching clusters (by annual quarter and type of region[19]).
5. Calculate the Mahalanobis distance based on $Ps^{i,rc,rd}(x)$ and selected X as the $B(x)$
6. Set a multiplier $m \in \left]0,1\right]$.
7. Run a pre-matching process to identify h based on the distance distribution of nearest neighbors in each matching cluster: a) Select a treated observation i. b) Use the nearest neighbor in terms of the Mahalanobis distance, given that j lies within the cluster cl; save the distances between the comparisons. c) Extract the 75th percentile of all distance values within cluster cl. d) Use the 90th percentile across all 'cl p75-distance values' as the bandwidth h.

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[16] Techniques that have been discussed to assess the optimal choice of bandwidth are not feasible in the context described here.

[17] The matching algorithm used mainly corresponds to that used in Lechner (1999) and Almus (2004). Note that we used the psmatch2 (version 3.1.5) command provided by Leuven/Sianesi (2003) for the statistical software package STATA 10.1.

[18] i denotes individual characteristics, rc indicates regional and control variables, rd marks the set of regional dummy variables.

[19] For the region type we used the 'five-group' classification suggested by Blien/Hirschenauer (2005). Among other things this classification controls for a region's economic development, its agglomeration structure, its local unemployment rate and any seasonal labor market fluctuation.

8. Run the clustered matching algorithm based on *h* taken from (7) which is multiplied by *m*.

→ if the balancing property is not sufficient, re-run from (7) based on additional attributes that are added to the calculation of the Mahalanobis distance.

→ if balancing is not sufficient based on the addition of attributes, re-run from (6) with a smaller multiplier.

Note that we calculated the standard errors (SE) of the estimator in (4) following Lechner (2001):

$$SE(ATT) = \frac{1}{N_i}Var(Y_i^{D=1}) + \frac{\sum_{n=1}^{N_j}W_n^2}{(N_i^2)}Var(Y_j^{D=0}) \tag{6}$$

However, in the calculation based on Formula (6) we implicitly assume that the individuals (treated and matched untreated) are independent. Therefore, in order to emphasize the issue of regional clustering (non-independence of observations within a regional entity) as reported in section 4 we also calculate two measures that provide information about the potential misspecification of the standard error. The first measure is a design-effect indicator (denoted by 'se^r/se, I') that focuses on the ratio of the two standard errors taken from the non-weighted and unrestricted sample of the treatment effect estimation based on a simple logit model with (se^r) and without robust standard errors (se). High values indicate a strong correlation between observations and therefore a high risk of the common variance estimation being mis-specified. The second measure follows the same logic and is also calculated as a ratio (denoted by 'se^r/se, II') but focuses on the weighted and restricted population (matched sample). Nevertheless, using such indicators is not common in evaluation contexts and may only be regarded as a rough indication of the potential effect of clustering.

5 Results

Results for the main groups

Table 2 also reports statistics related to the treatment effect. In particular we focus on the ATT measured in accordance with Formula (4; Y^1) and the subsequent inference statistics. For the interpretation of the ATT (Y^1) note that a positive sign is associated with a higher failure rate of those receiving additional support compared to those who only received the bridging allowance, and therefore indicates a negative effect of the treatment on the likelihood of remaining self-employed.

Table 2
Treatment effects

Treatment / type of exit	on support[A]		matched[A]		ATT[B]		inference		balance (MSB)[C]		F-test[D]	
	Nj	Ni	Nj	Ni		se	se^r/se, I	se^r/se, II	before	after	before	after
Training												
all types:	1555	118236	1555	32968	0.006	0.015	1.799	0.818	24.866	2.380	0.000	0.631
unempl.:	1555	118236	1555	32968	0.023[+]	0.014	1.364	1.031	24.866	2.380	0.000	0.631
employment:	1555	118236	1555	32968	-0.013	0.009	1.163	1.020	24.866	2.380	0.000	0.631
coaching												
all types:	7204	177573	7204	27529	0.002	0.008	2.237	1.623	28.573	0.970	0.000	0.823
unempl.:	7204	177573	7204	27529	0.007	0.007	2.166	1.179	28.573	0.970	0.000	0.823
employment:	7204	177573	7204	27529	-0.013[*]	0.005	1.392	1.060	28.573	0.970	0.000	0.823
discr. start-up support (DSUS)												
all types:	8942	206189	8942	22033	0.010	0.007	3.633	1.042	24.773	0.885	0.000	0.523
unempl.:	8942	206189	8942	22033	0.021[*]	0.007	2.329	0.888	24.773	0.885	0.000	0.523
employment:	8942	206189	8942	22033	-0.011[*]	0.005	1.942	1.358	24.773	0.885	0.000	0.523

[A]   j and i are indicators for the population (i = treated population; j = untreated persons)

[B]   ATT stands for the average treatment effect on the treated; the ATT is calculated on the basis of Formula (4): $\Pr(T^k \leq 36)$

[C]   the balancing property is calculated as the averaged mean standardized bias based on individual and regional variables as well as on the three propensity scores

[D]   the test used is an F-test of the joint insignificance of all regressors before and after matching

+   indicates statistical significance at the 90% level; * indicates statistical significance at the 95% level

Source: IEB, own calculations

As column five shows, the ATTs (Y^1) are relatively low and in most cases remain statistically insignificant. To make this clear, in empirical terms this indicates that (on average) additional support does not contribute to lengthening the duration of self-employment. In the case of *training* for self-employment, for instance, statistically significant effects can only be identified for exits into unemployment, indicating that this form of additional support is associated with an increase in quitting self-employment if one focuses on exits into unemployment. In contrast, *coaching* significantly reduces exits into dependent employment (level of statistical significance: 95%), which means that business founders who received *coaching* are less likely to enter dependent employment when quitting self-employment. Furthermore, focusing on the *discretionary start-up support* we find exits into employment are less likely, whereas exits into unemployment increase.

With respect to clustering, the indicator for the design effect ('se^r/se, I') shows a potentially high correlation of the observations within regions. However, focusing on the 'se^r/se, II' ratio suggests that the matching procedure solves the problem to some extent. Furthermore, despite some statistically significant treatment effects of additional support for self-employment Table 2 shows that the magnitudes of the identified treatment effects remain rather small. For example, a statistically significant difference in survival between the treated and the matched untreated of 0.021 (see *discretionary start-up support*; exits into unemployment) means that additional support increases exit probabilities by no more than 2.1 percentage points over a period of three years. This is less likely to be of economic importance.

However, when assessing this finding we must be aware that there may be different reasons for low treatment effects; namely: time-variant effects, heterogeneous treatment effects and methodical misspecifications. Taking such patterns into account suggests that existing effects may otherwise be averaged out. We focus on these issues below.

Time-variant treatment effects
To reveal time-dependent differences in survival Figure 2 displays the treatment effect as the difference in the non-parametric survival functions between the treated and the (weighted) untreated comparison group. This provides information about the net outcome of additional support in terms of better survival chances over time. Note that the ATT now focuses on Y^2 so a negative value reflects a lower survival chance in the population with additional support compared to those with no treatment. Again results are reported for different types of exit from self-employment. To take right-censoring into account the survival functions are calculated as the proportion of observations that are self-employed at time t in relation to the pool of individuals that are still at risk. 95% confidence intervals (dashed lines) are calculated using the Greenwood (1926) approximation of standard errors (without controlling for clustering).

Figure 2
Time-dependent treatment effects

Training - All

Difference in Survival functions between treated and untreated

all types of exit

exits into unemployment

exits into employment
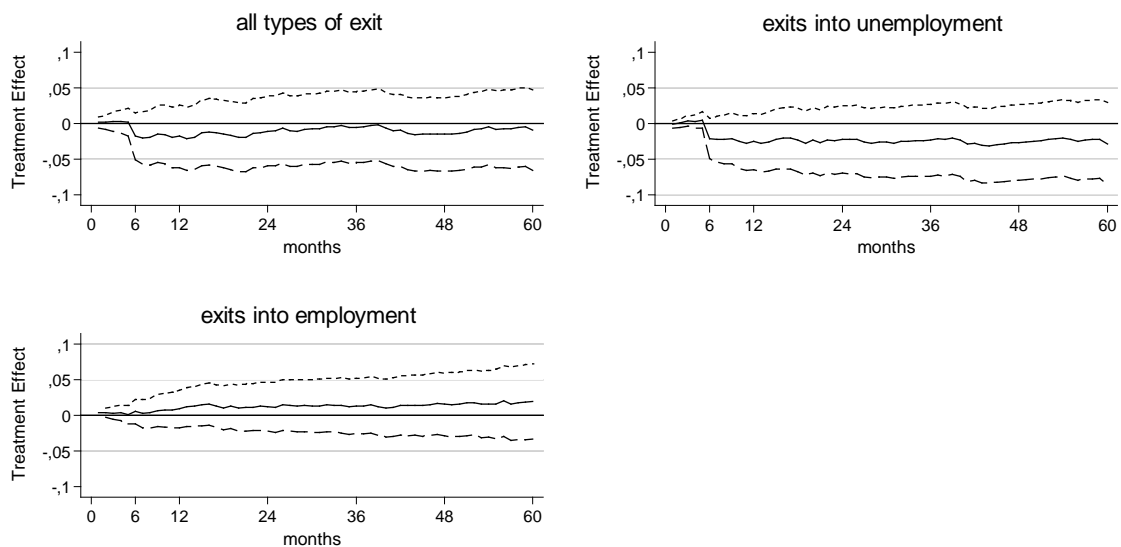
obs: 1555 treated, 32968 untreated
source: IEB, own calculations
bounds are based on the Greenwood (1987) approximation of the standard errors

Coaching - All

Difference in Survival functions between treated and untreated

all types of exit

exits into unemployment

exits into employment
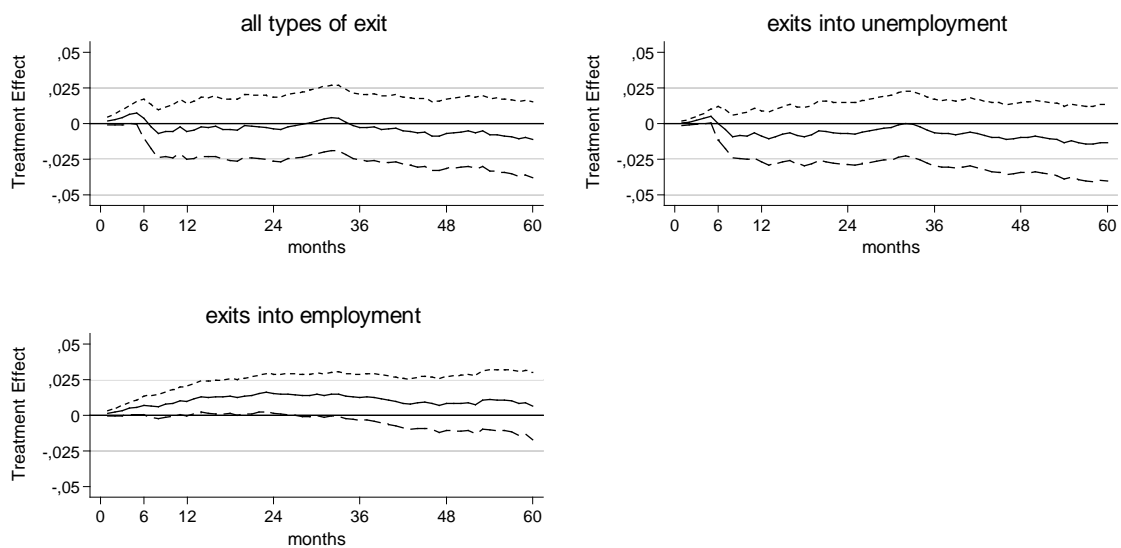
obs: 7204 treated, 27529 untreated
source: IEB, own calculations
bounds are based on the Greenwood (1987) approximation of the standard errors

DSUS - All
Difference in Survival functions between treated and untreated

all types of exit

exits into unemployment

exits into employment

obs: 8942 treated, 22033 untreated
source: IEB, own calculations
bounds are based on the Greenwood (1987) approximation of the standard errors

Note: The dashed lines indicate the upper and the lower bounds of the 95% confidence interval.

As Figure 2 shows, time-dependent effects exist for all types of additional support. However, the extent to which variat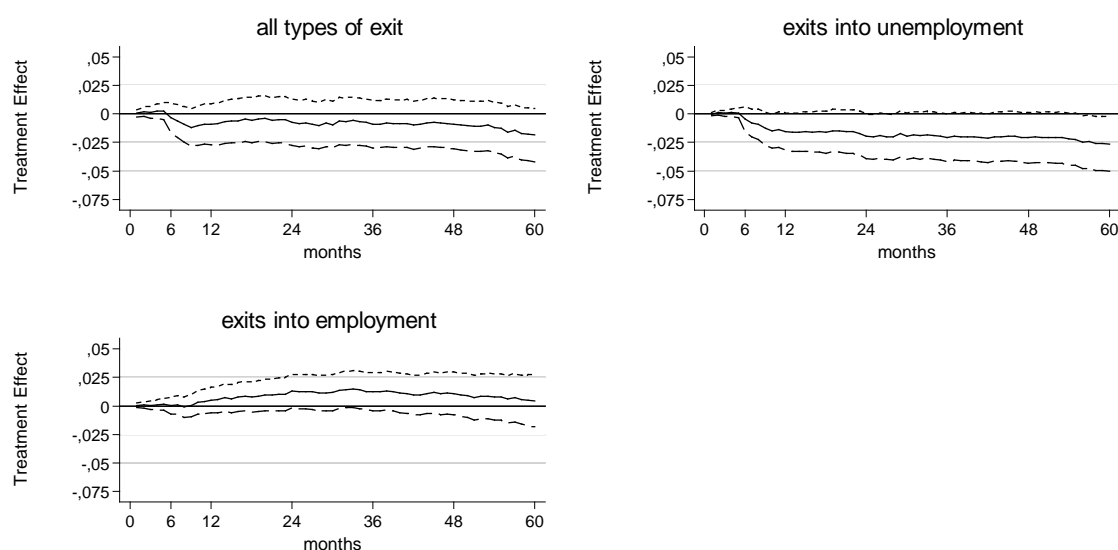ion occurs over time differs across the type of additional support and for the type of exit that we consider. For example, - putting statistical significance aside - with regard to *training* for self-employment it is found that additional support is associated in comparative terms with a loss of survival chances when we focus on all types of exits during the first 24 months. However, after a period of 24 months we see that the survival difference between the treated and the matched non-treated is almost equal to zero, while we see relatively constant differences in survival for exits into unemployment and dependent employment. In general, there is little evidence that a benefit resulting from additional support tends to increase with time when focusing on exits in general and into unemployment (the opposite applies for exits into employment). Nevertheless, it is worth noting that "*trained*" periods of self-employment in particular have a lower survival rate immediately after the end of the *bridging allowance* while entries with *coaching* tend to have higher survival rates at this point in time. In particular, we find a large share of early exits in the "*trained*" population, which points to a strong post-entry selection. A similar pattern is also found for the *coaching* population but it is less pronounced. However, this finding may indicate that additional support increases the perception of self-employment as being an inferior option to employment.

Heterogeneous treatment effects

For plausible reasons effects caused by additional support may also differ for specific sub-populations. As research on self-employment shows, outcome differences are likely to emerge between the two genders as they are associated with differences in

risk attributes, investment behavior, income and growth intentions (Williams 2000; Georgellis/Wall 2005; Wagner 2007). Following this idea we control for gender differences, for differences between eastern and western Germany and we stratify the population on the basis of a generalized propensity score (five groups according to the 20 % percentiles). However, the findings do not differ substantially from the results for the whole population (see Tables A.4a-c in the appendix). In most cases we are unable to identify significant effects - except for the *discretionary start-up support,* where we find the highest treatment effect for the subgroup with low treatment dispositions and where we find increased exits into unemployment for those who received additional support (ATT = 0.065; se = 0.027).

Common support and matching quality

In order to assess the quality of the matching procedures we examined the joint distributions of the propensity scores for individuals with and without additional support. According to this graphical assessment in Figure A.2 (in the appendix), the included matched comparisons are sufficiently balanced. Furthermore, in accordance with Rosenbaum/Rubin (1983 and 1985) we may also use the mean standardized bias (MSB) as an indicator for the overall balance of the matched comparisons.[20] As reported in Table 2 the average MSB decreases strongly after the matching procedure. This is a fairly good indication of a sufficiently good balance; in fact a better balance than in other related studies (e.g. Baumgaertner/Caliendo 2008). Finally, the F-test statistic also reveals joint insignificance of the covariates in a logistic regression in the matched sample.[21] Likewise, t-tests of mean differences in individual variables between matched treated and non-treated individuals also support the rejection of the hypothesis of differences in the matched sample.

Additional findings and robustness checks

The most critical objection in this evaluation may refer to the point that individuals with unpromising business projects may have higher relative utilities of using additional self-employment support and are therefore more likely to take advantage of the additional schemes aimed at self-employment promotion. Since this might be unobserved, matching may fail to estimate unbiased treatment effects. However, various checks were conducted in order to assess the robustness of the estimates. First of all, we performed different matching procedures including single nearest

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[20] The MSB is defined as the difference in the sample mean of each covariate in the treated and control subsamples as a percentage of the square root of the average of the sample variances in both groups (before and after matching). We control for the following set of attributes: gender, age, higher education(upper secondary), college or university degree, small business background and being a master craftsman, western or eastern Germany, date of entry, all three propensity scores, occupation based on a one-digit classification. Furthermore all regional attributes are included: local unemployment rate, local firm hazard, variation index of local unemployment and the regional share of additional support.

[21] The 'after test' (see Table 2) performs a test on the null hypothesis that the entropy of the treatment selection model equals zero when it is restricted to the weighted matched population.

neighbors, caliper matching and propensity kernel matching in order to check methodical issues, and on the whole they support the reported findings. In addition, we also tested the potential effect of unobserved heterogeneity by explicitly excluding information and by calculating post-estimation Rosenbaum bounds.[22] In particular, neither of the sensitivity tests supports the hypothesis that unobserved heterogeneity affects the reported estimates. In addition, we also re-ran the estimates including only regions with high ratios of additional support in order to take into account a potential interference of a 'negative creaming' (assuming that negative selection would be relatively higher in regions with only few participants). Finally, we replicated estimations while focusing on regions with low levels of activity covered by state-specific ESF-funding for additional self-employment promotion in order to test for the effect of potential substitutes.[23] On the whole, none of the robustness checks reveals substantial differences from the findings reported above.

6 Summary and conclusions

In this study we examine for the first time the treatment effect of additional start-up support in terms of employment stability. The subjects of the investigation are *training* and *coaching* for self-employment and *discretionary start-up support* (a scheme comprising different programs with a regional focus). Even though recent policies have paid increasing attention to promoting self-employment little is known about the net outcome of such schemes. In our analysis we use data taken from the IEB, which is an integrated German database that makes it possible to examine all cases of participation in employment and training schemes offered by the Federal Employment Agency. Detailed information about the employment history, qualification levels and socio-demographic information as well as rich regional data about local labor market conditions can be controlled for in the evaluation context, which makes the statistical matching approach a valid evaluation technique.

First of all, we find that selection into an additional support scheme (treatment assignment) mainly seems to be a result of differences in local strategies in active labor market policy across Germany. In particular, the results show that few regions have very large shares of additional support and that in most regions additional support for self-employment seems to be less attractive. This finding indicates a particular regional specialization in the promotion of self-employment. This issue has not

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[22] The Rosenbaum bounds provide information about the potential change in an estimator if a hypothetical factor is included which covers unobserved heterogeneity (see Rosenbaum 2002 or Becker/Caliendo 2008 for details). In the sensitivity analysis we used the STATA module "mhbounds.ado" - as suggested by the authors (Becker/Caliendo 2008) we focused the sensitivity test only on the nearest neighbor matching without replacement.

[23] We used data from the state ESF monitoring of 2002 to identify federal states with low figures for participation in ESF-funded coaching, self-employment training and counseling. Data are available only for western Germany. Since employment promotion is costly it is assumed that other programs that were not funded by the ESF can be treated as negligible.

been addressed or has been underreported in previous evaluation studies. In order to solve the problem of a potential selection bias we implement a matching approach which seeks to address the specific regional context of the selection process and at the same time allows for regionally unequal chances of start-up success. Finally, we also put a great deal of effort into examining the robustness of our findings.

The evaluation shows that *training courses* and *coaching* for self-employment tend to increase hazards, while exits into employment seem to decrease. However, statistical significance is limited for all schemes and all outcome measures. For example, *coaching* mainly shows relevance for (decreased) exits into dependent employment, while significant effects for *training courses* are limited to (increased) exits into unemployment. Statistically significant treatment effects mainly concentrate on *discretionary start-up support*, in which survival is less likely, exits into unemployment are increased and hazards into dependent employment are decelerated. However, the treatment effects remain small. Several robustness checks support these findings.

To sum up, our findings indicate that on average *training* and *coaching* do not correspond to what was intended by the relevant policies. If individual 'learning' were improved due to additional non-financial support, we would have expected survival to be higher and/or exits into dependent employment to be accelerated. However, we find insignificant treatment effects for exits in general and significant 'negative' treatment effects (negative in terms of the policy objective) related to *training courses* and to the "*discretionary start-up support*" (increased exits into unemployment). This is interesting for at least two reasons: first, it shows that the support scheme with the largest degrees of freedom is associated with some non-ignorable treatment effects and second, the treatment is related to a decrease in survival. One possible explanation for this finding is that external expertise may tend to improve preconceptions of the future economic prospects of the business and may therefore cause higher exit rates in order to avoid running into debt. Furthermore, we find a strong shift in survival at the end of the basic financial support, which points to the fact that treatments increase the perception of self-employment as an inferior employment option.

Unfortunately we know little either about the objectives, forms and regulation of the individual support schemes and the determination of these treatment effects in detail or about the mechanisms that are associated with these findings. Therefore, further research is needed that allows a deeper understanding of the way non-financial support operates. In particular, future evaluation must be aware of the high level of complexity when studying the promotion of self-employment (e.g. multilevel promotion, spatial heterogeneity). This also motivates further research at a more local level to take into account regional differences in the political strategies of active labor market policy.

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Appendix

Table A.1
Self-employment promotion schemes of active labor market policy

	bridging allow-ance	discretionary start-up support	self-employment training	self-employment coaching
target group	individuals who are entitled to unemployment benefit and who wish to start a new business	individuals who wish to or who have started a business from a position of unemployment	individuals who plan to become self-employed	individuals who have started a business
focus	transition costs; financial support	regional policy	preparation and skills	external expertise, improved learning
benefits	• coverage of living expenses during the first six months plus extra payment for social security contributions payments are limited to the level of (potential) unemployment benefit	• flexible (experimental) types of support during the transition period, start-up period or the early period of self-employment • e.g. allowances for living expenses, technical equipment	• 4 to 12 weeks of training • coverage of training fees, travelling expenses and expenditures on child care • free selection of the course (usually professional training centers)	• coverage of coaching costs, travelling expenses and expenditures on child care • free selection of the coach to address individual topics (usually tax advisors or business consultants)
requirements	• self-employment activity ends or avoids unemployment • younger than 64 years of age • positive assessment of the business concept • evidence of new business activity or the start-up (difficulties in cases of a business buyout)	• does not conflict with the general directions of active labor market policy • only if other schemes (including national or regional business development programs) are not possible • limited to a total expenditure of no more than 10% of the regional integration budget	• entitled to receive regular support under the Social Code Book III – e.g. planned to apply for bridging allowance • preparing a start-up	• receiving support under Social Code Book III – usually bridging allowance • limited topics since 03/2003 (marketing, business development, psychological help) • subsidies are limited to a one-year period after start-up
validity period	Started in 1986; reformed in August 1994; changes made in 1997, 1998 and 2001; termination in 2006	started in 1998	started in 1998; restarted in 2000, terminated in 2006 several changes: e.g. total payment up to 9.000 euros (until 03/2003), and 4,600 euros between 02/2000 and 3/2003	started in 1998; restarted in 2000, several changes: see coaching; terminated in 03/2003

Source: Own compilation

Table A.2
Definition of the variables

gender (male)
　Sex is male. Source: Employment History.
age
　Age of the business founder at the beginning of the self-employment episode. Source: Employment History.
schooling (>= high school)
　Schooling equals upper secondary school leaving certificate (Germany: 'Abitur' or 'Fachabitur') or higher. Source: Job Search Register.
academic degree
　The founder holds an academic degree or diploma (university or college). Source: Job Search Register.
master craftsman / foreman
　The founder worked as a master craftsman or foreman (occupational status) in his or her last employment episode before starting the business. Employment episodes with a daily income lower than 5 euros or lasting less than 60 days (valid employment episode) are excluded. Source: Employment History.
management
　The founder worked in a management position in the last employment episode before starting the business. Source: Job Search Register.
commercial background
　The founder is experienced and (formally) trained in a commercial occupation. Source: Job Search Register (apprenticeship information); Employment History (using the two-digit classification of a selected set of occupations; experience).
short unemployment
　The unemployment duration before setting up the business is less than 3.5 months (difference between last employment and beginning of the supported episode of self-employment; missing values are imputed). Source: Employment History
number job changes
　Number of distinct occupations classified using the two-digit classification during the last two years before starting the business. Source: Employment History.
marginal part-time employment
　Founder worked in a marginal part-time job during the last valid employment episode before setting up the business. Source: Employment History.
wage premium
　Identifies whether a founder earned 1.66 times more than the expected monthly wage in the last valid employment episode. The expected income is a regressed function of the income and a selected set of covariates (e.g. age, schooling, job changes, gender, occupational status, size of the establishment) conditional on the type of occupation and part- or full-time status. Source: Employment History.
size of establishment / small business
　Size of the establishment: statistical mode of the number of employees in the establishments during the last five years before setting up the business. Only the employment records that last for more than 3 months with an income greater than zero are included. Source: Establishment History Panel.
　Small Business: The founder has usually worked (modus of the last five years) in establishments with less than 20 employees. Source: Establishment History Panel.
unemployment rate (UER)
　Monthly unemployment rate of the local labor market district. This information is merged with the micro data after splitting the dataset into three-month periods. Berlin is treated as one region (unweighted average). Source: Employment Statistics.
unemployment index
　Time-varying covariate that covers a normalized unemployment rate relative to the starting point (index = UER*100/UER). Source: Employment Statistics.
variation index
　Captures the variation of the monthly unemployment rate for each local labor market district. The index relates to the square root of the squared mean error of a time series estimation. Source: Employment Statistics.
share (%) of vanishing establishments (local firm hazard)
　Identifies the share of establishments that are found in t-1 but do not exist in t in the local labor market district. Source: Establishment History Panel.
cohort
　Represents the year in which the founder set up the business. Source: Participants-in-Measures History File.
profession / occupation
　Distinguishes seven clusters of occupations based on a two-digit job classification related to the last valid employment episode. Source: Employment History.
exit
　Equals one if there is a an episode that is not-self-employment after starting the business (beginning of the support). Source: all sources of the IEB. The identification distinguishes between a) employment (dependent employment with notification to the social security system), b) unemployment (with or without unemployment benefits) or participation in an employment or training measure, and c) other (e.g. marginal part-time employment). Before identifying these spells, the data set was reorganized to merge different types of spells.
duration of self-employment
　The duration of self-employment is the difference between the start date of the support (start-up of the business) and the date of the first episode that was not-self-employment after starting the business. Censoring refers to 31 Dec. 2005.

Figure A.1
Definition of valid additional support

self-employment training

self-employment coaching and discretionary start-up support

corridor:
$b = t_0 - 365$; $a = t_0 + 21$

corridor:
$b_c = t_0 - 21$; $a = t_0 + 365$
$b_{\S10} = t_0 - 365$; $a = t_0 + 365$
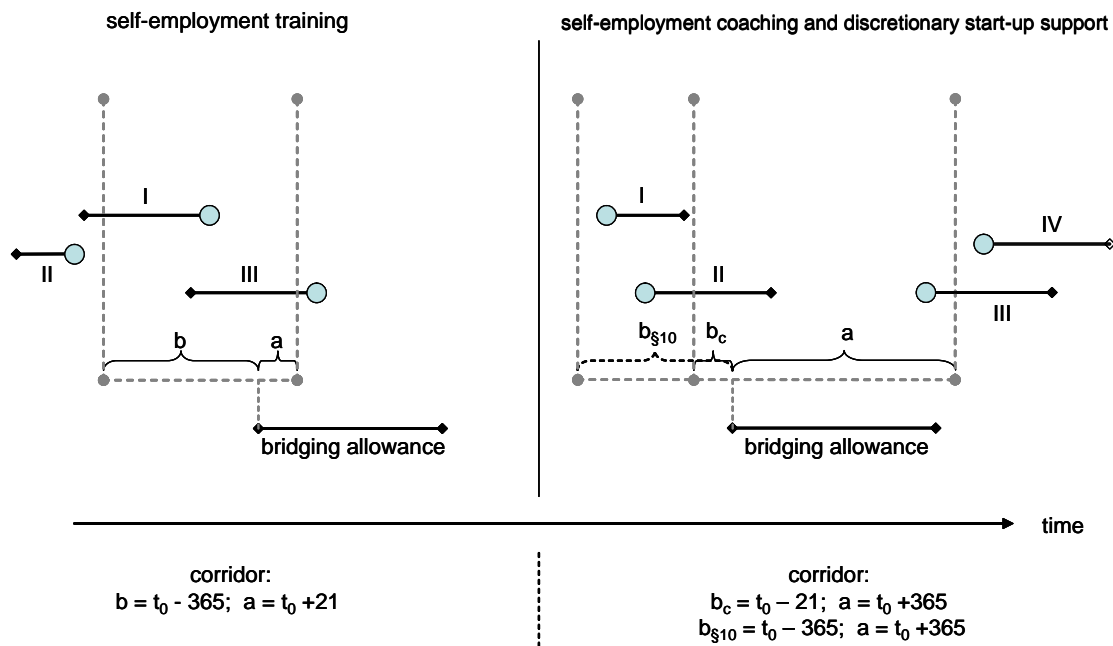
Source: own illustration

To focus only on valid additional support the study uses time corridors as displayed in Figure A.1. Following this figure *training*, *coaching* and *discretionary start-up support* are included only if they lie within a certain time corridor in relation to the start date of the bridging allowance. For simplicity the figure displays the number of the episode (I to IV) and the type of period (b=before the start of bridging allowance; a = after the start) as well as the time corridor to define the cut-off-point for including or excluding observations. For the training population this includes observations where the end date of the training lies within a corridor of one year before the start date of the bridging allowance (entry date) and end dates that are no later than 3 weeks after the entry date (*training courses* must have started before the entry date). For *coaching* we set a time window of between -21 days and +365 days. This means that coaching is only valid if the entry date is within 3 weeks after the start date of coaching and coaching must begin no later than one year after the bridging allowance. For *discretionary start-up support* the time corridor is +/- one year.

Listing A.1
Description of the matching algorithm

Labor market districts (regions) that have no participants in the support schemes evaluated do not enter the study, because the joint support in these regions is zero (step 2). To include statistical information about the assignment process, linear predictions of logit estimates are used. To emphasize the distinct levels of selection three separate scores are applied. The first one includes only individual characteristics, the second is based on regional attributes and time intervals, the third is based on dummy variables of the labor market district and time (step 3).

Before calculating M(x), the sample of i and j is stratified according to regional clusters and time intervals (step 4). Region (type of region) and time (13 annual quarters) define distinct matching clusters to ensure that comparisons are only taken from observations with the most similar external economic market conditions and to take into account the dominating pattern of the treatment assignment. The exact date of entry, the scores and the interaction between the scores are added to the list of attributes that enter the calculation of the Mahalanobis distance (step 5). The inclusion of further variables depends on step 8.

A pre-within sample matching procedure is then performed to identify a bandwidth parameter (step 7). This step ensures that h is drawn directly from the clustered sample. Nearest neighbor matching guarantees that only the closest j are used. Based on the realized $n^{i,j}$ distances the 75th percentile is taken as the cluster k specific bandwidth (h^k). This avoids potential high distance matches within a cluster. Next, the 90th percentile of all h^k is used as the overall bandwidth parameter h. This procedure is implemented to weight matches in clusters in which only high distance matches exist.

The final matching procedure is then performed based on h and proceeds in step 8. The multiplier defined in step 6 ensures a flexible adjustment of the bandwidth parameter and is only rescaled if the inclusion of additional variables (or interaction terms) does not improve the balance between i and j after matching.

Figure A.2
Support-Overlap

Support-Overlap, Training (All)
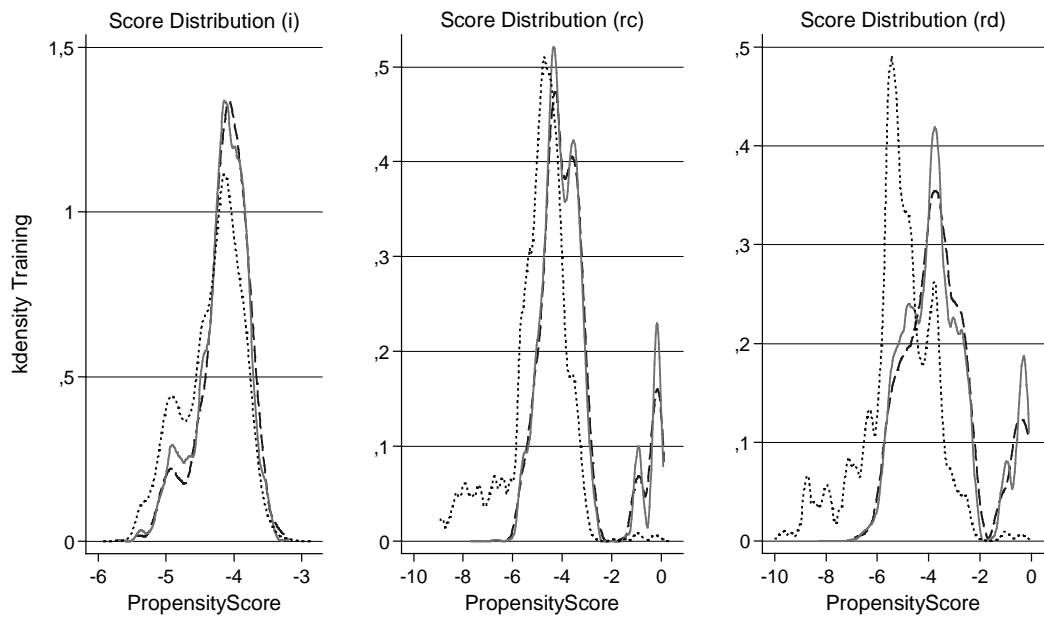
Support-Overlap, Coaching (All)
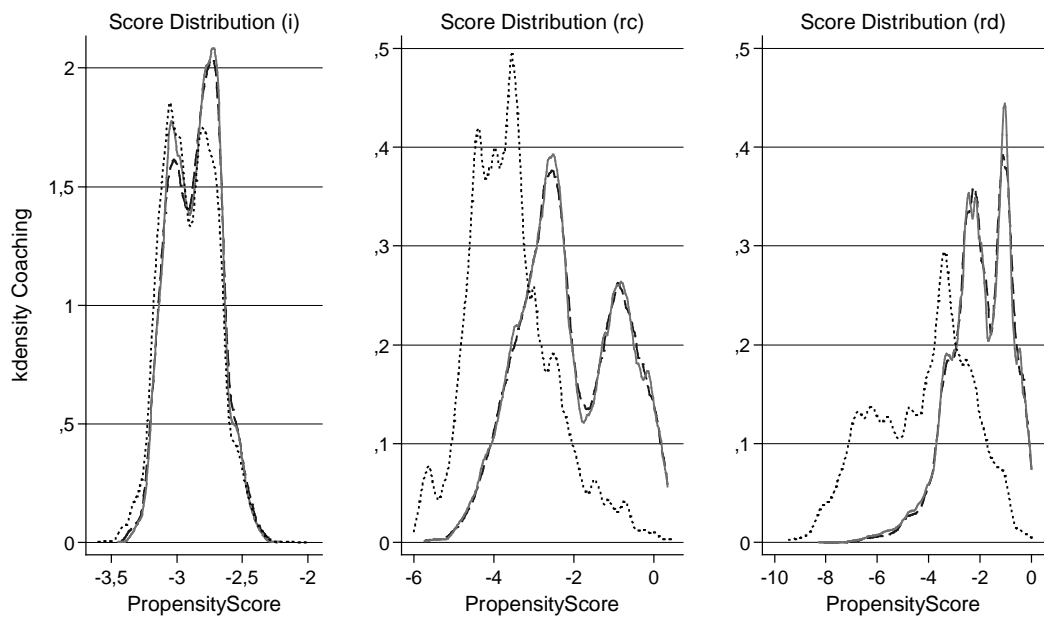
Support-Overlap, DSUS (All)
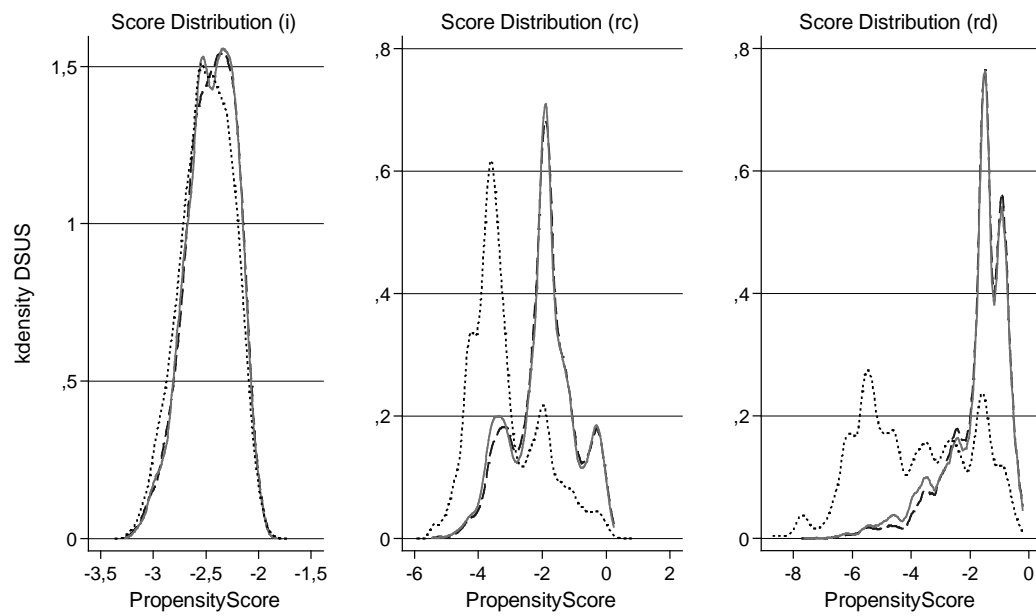
Note: The dashed line indicates the unconditional distribution of the propensity score – the other line shows the distribution of the propensity score for the matched treated and untreated populations.

Source: IEB, own calculations

Table A.3
Treatment selection (estimated effects)

	Coaching		Training		Discretionary start-up support	
	b	se	b	se	b	se
individual characteristics						
male	-0.288***	(0.05)	-0.337***	(0.05)	-0.139**	(0.07)
age	0.061***	(0.01)	0.066***	(0.02)	0.084***	(0.01)
age squared	-0.001***	(0.00)	-0.001***	(0.00)	-0.001***	(0.00)
schooling (>=upper secondary school)	0.122***	(0.04)	0.251***	(0.07)	0.163***	(0.04)
academic degree	-0.001	(0.04)	0.036	(0.06)	0.036	(0.03)
master craftsman / foreman	0.050	(0.05)	0.213*	(0.12)	0.051	(0.06)
management	-0.066*	(0.04)	-0.136	(0.12)	-0.038	(0.03)
short unemployment	-0.256***	(0.04)	-1.169***	(0.21)	-0.457***	(0.04)
small business	-0.023	(0.02)	-0.031	(0.03)	0.007	(0.02)
occupation (one-digit classification; 10 types)	included in the model but omitted in this table					
Local conditions						
unemployment (ue) rate	0.011	(0.02)	-0.000	(0.02)	-0.018	(0.02)
ue variation	-1.351***	(0.06)	1.440***	(0.21)	1.006***	(0.05)
firm hazard	-0.069*	(0.04)	-0.018	(0.03)	-0.061***	(0.02)
share of training	0.065***	(0.00)	0.182***	(0.00)	-0.019***	(0.00)
share of coaching	0.113***	(0.00)	0.025***	(0.00)	0.043***	(0.00)
share of DSUS	0.028***	(0.00)	0.065***	(0.00)	0.159***	(0.00)
Eastern Germany	2.192***	(0.21)	1.110***	(0.32)	1.516***	(0.24)
Time (quarter since 1/2000 = reference group)						
2nd	0.718***	(0.10)	2.088***	(0.38)	0.613***	(0.13)
3rd	0.916***	(0.16)	2.316***	(0.41)	0.856***	(0.17)
4th	0.867***	(0.30)	2.261***	(0.43)	0.975***	(0.20)
5th	1.180***	(0.30)	2.179***	(0.43)	0.958***	(0.17)
6th	1.490***	(0.32)	2.218***	(0.41)	0.846***	(0.20)
7th	2.052***	(0.30)	1.689***	(0.39)	0.847***	(0.22)
8th	2.642***	(0.29)	-0.725	(0.46)	0.917***	(0.27)
local labor market district (153 dummies)	included in the model but omitted in this table					
constant	-6.889***	(0.35)	-9.637***	(0.42)	-8.570***	(0.29)
N	337407.000		257281.000		365785.000	
ll	-63343.482		-15649.085		-74211.991	
bic	127017.920		31622.076		148757.036	

Table reports estimated coefficients (b) and standard errors (se; in parentheses) based on logit model estimations

Source: IEB, own calculations

Table A.4a
Treatment effects for '*training*' (sub groups and robustness checks)

Treatment / type of exit	on support[A] Nj	Ni	matched[A] Nj	Ni	ATT[B]	se	inference se^r/se I	se^r/se II	balance (MSB)[C] before	after	test[D] before	after
Single nearest neighbor												
all types:	1983	136376	1983	1816	0.023	0.017	1.799	1.094	27.318	1.610	0.000	0.049
unempl.:	1983	136376	1983	1816	0.020	0.016	1.364	1.113	27.318	1.610	0.000	0.049
empl.:	1983	136376	1983	1816	0.010	0.011	1.163	0.943	27.318	1.610	0.000	0.049
Caliper matching												
all types:	1516	136376	1516	1487	0.031	0.018	1.799	1.072	27.318	2.558	0.000	0.060
unempl.:	1516	136376	1516	1487	0.030	0.017	1.364	1.047	27.318	2.558	0.000	0.060
empl.:	1516	136376	1516	1487	0.009	0.012	1.163	0.962	27.318	2.558	0.000	0.060
Kernel PS-matching												
all types:	1983	136376	1983	1816	0.023	0.017	1.799	1.094	27.318	1.610	0.000	0.049
unempl.:	1983	136376	1983	1816	0.020	0.016	1.364	1.113	27.318	1.610	0.000	0.049
empl.:	1983	136376	1983	1816	0.010	0.011	1.163	0.943	27.318	1.610	0.000	0.049
All, but excluding information												
all types:	1558	118236	1558	22234	-0.001	0.016	1.725	0.842	26.087	1.984	0.000	0.851
unempl.:	1558	118236	1558	22234	0.021	0.015	1.423	1.041	26.087	1.984	0.000	0.851
empl.:	1558	118236	1558	22234	-0.013	0.010	1.172	0.842	26.087	1.984	0.000	0.851
Western Germany												
all types:	1321	88003	1321	25967	0.027	0.017	1.670	1.011	28.828	2.266	0.000	0.961
unempl.:	1321	88003	1321	25967	0.030	0.015	1.405	0.996	28.828	2.266	0.000	0.961
empl.:	1321	88003	1321	25967	0.001	0.011	1.099	0.820	28.828	2.266	0.000	0.961
Western Germany excluding regions with high ESF state funding												
all types:	212	30457	212	6287	0.019	0.040	0.972	0.921	24.129	1.753	0.000	1.000
unempl.:	212	30457	212	6287	0.073	0.038	0.941	1.150	24.129	1.753	0.000	1.000
empl.:	212	30457	212	6287	-0.042	0.022	1.151	0.888	24.129	1.753	0.000	1.000
Eastern Germany												
all types:	286	37040	286	1190	0.013	0.036	1.239	0.758	22.253	2.667	0.000	0.997
unempl.:	286	37040	286	1190	0.000	0.035	1.022	1.053	22.253	2.667	0.000	0.997
empl.:	286	37040	286	1190	0.024	0.019	1.232	1.032	22.253	2.667	0.000	0.997
Male population												
all types:	1126	83300	1126	33874	-0.003	0.017	1.555	0.739	24.827	1.783	0.000	0.994
unempl.:	1126	83300	1126	33874	0.015	0.016	1.047	1.077	24.827	1.783	0.000	0.994
empl.:	1126	83300	1126	33874	-0.010	0.010	1.165	0.629	24.827	1.783	0.000	0.994

Table A.4a
Treatment effects for '*training*' (sub groups and robustness checks)   continued

Treatment / type of exit	on support[A]		matched[A]		ATT[B]		inference		balance (MSB)[C]		test[D]	
	Nj	Ni	Nj	Ni		se	se^r/se I	se^r/se II	before	after	before	after
Female population												
all types:	579	28320	579	15001	0.008	0.024	1.353	0.846	27.863	2.825	0.000	0.996
unempl.:	579	28320	579	15001	0.027	0.022	1.249	1.468	27.863	2.825	0.000	0.996
empl.:	579	28320	579	15001	0.001	0.017	0.845	1.024	27.863	2.825	0.000	0.996
Low treatment disposition												
all types:	121	49488	121	1256	0.054	0.054	1.799	0.776	14.720	2.470	0.000	1.000
unempl.:	121	49488	121	1256	0.050	0.051	1.364	0.948	14.720	2.470	0.000	1.000
empl.:	121	49488	121	1256	-0.002	0.030	1.163	0.946	14.720	2.470	0.000	1.000
High treatment disposition												
all types:	776	26238	776	3462	0.009	0.023	1.799	0.845	23.486	2.123	0.000	0.997
unempl.:	776	26238	776	3462	0.000	0.021	1.364	0.823	23.486	2.123	0.000	0.997
empl.:	776	26238	776	3462	0.014	0.016	1.163	0.899	23.486	2.123	0.000	0.997

Table reports selected statistics of the evaluation for subgroups and selected robustness checks;

[A]   j and i are indicators for the population (i = treated population; j = untreated persons)

[B]   ATT stands for the average treatment effect on the treated; the ATT is calculated on the basis of formula (4): $Pr(T^k \leq 36)$

[C]   the balancing property is calculated as the averaged mean standardized bias based on individual and regional variables as well as the three propensity scores

[D]   the test used is an F-test of the joint insignificance of all the regressors before and after matching

Source: IEB, own calculations

Table A.4b
Treatment effects for '*coaching*' (sub groups and robustness checks)

Treatment / type of exit	on support[A] Nj	Ni	matched[A] Nj	Ni	ATT[B]	se	inference se^r/se I	se^r/se II	balance (MSB)[C] before	after	test[D] before	after
Single nearest neighbor												
all types:	10107	180283	10107	8611	-0.012	0.008	2.237	1.603	28.604	1.107	0.000	0.003
unempl.:	10107	180283	10107	8611	-0.004	0.007	2.166	1.435	28.604	1.107	0.000	0.003
empl.:	10107	180283	10107	8611	-0.016	0.005	1.392	1.371	28.604	1.107	0.000	0.003
Caliper matching												
all types:	9393	180283	9393	8347	-0.006	0.008	2.237	1.389	28.604	0.998	0.000	0.010
unempl.:	9393	180283	9393	8347	-0.003	0.007	2.166	1.426	28.604	0.998	0.000	0.010
empl.:	9393	180283	9393	8347	-0.012	0.005	1.392	1.225	28.604	0.998	0.000	0.010
Kernel PS-matching												
all types:	10107	180283	10107	8611	-0.012	0.008	2.237	1.603	28.604	1.107	0.000	0.003
unempl.:	10107	180283	10107	8611	-0.004	0.007	2.166	1.435	28.604	1.107	0.000	0.003
empl.:	10107	180283	10107	8611	-0.016	0.005	1.392	1.371	28.604	1.107	0.000	0.003
All, but excluding information												
all types:	6906	177573	6906	23810	0.002	0.008	2.608	1.411	29.724	0.916	0.000	0.919
unempl.:	6906	177573	6906	23810	0.011	0.008	2.334	1.071	29.724	0.916	0.000	0.919
empl.:	6906	177573	6906	23810	-0.017	0.005	1.454	1.164	29.724	0.916	0.000	0.919
Western Germany												
all types:	2935	129836	2935	18630	0.014	0.011	1.519	1.022	28.336	0.702	0.000	1.000
unempl.:	2935	129836	2935	18630	0.005	0.010	1.335	1.101	28.336	0.702	0.000	1.000
empl.:	2935	129836	2935	18630	-0.007	0.007	1.710	1.007	28.336	0.702	0.000	1.000
Western Germany excluding regions with high ESF state funding												
all types:	1615	34537	1615	13288	0.019	0.015	1.336	0.613	23.574	1.289	0.000	0.999
unempl.:	1615	34537	1615	13288	0.016	0.014	1.065	0.872	23.574	1.289	0.000	0.999
empl.:	1615	34537	1615	13288	-0.007	0.009	1.369	1.481	23.574	1.289	0.000	0.999
Eastern Germany												
all types:	4269	47737	4269	9497	-0.008	0.011	1.931	0.846	17.989	0.754	0.000	0.957
unempl.:	4269	47737	4269	9497	0.006	0.010	1.955	0.833	17.989	0.754	0.000	0.957
empl.:	4269	47737	4269	9497	-0.017	0.005	1.088	0.831	17.989	0.754	0.000	0.957
Male population												
all types:	5405	124239	5405	28342	-0.002	0.009	2.541	1.684	30.354	1.114	0.000	0.901
unempl.:	5405	124239	5405	28342	0.002	0.008	2.120	1.377	30.354	1.114	0.000	0.901
empl.:	5405	124239	5405	28342	-0.010	0.005	1.268	1.247	30.354	1.114	0.000	0.901

Table A.4b
Treatment effects for '*coaching*' (sub groups and robustness checks)   continued

Treatment / type of exit	on support[A]		matched[A]		ATT[B]		inference		balance (MSB)[C]		test[D]	
	Nj	Ni	Nj	Ni		se	se^r/se I	se^r/se II	before	after	before	after
Female population												
all types:	2667	43564	2667	12747	0.006	0.012	1.437	1.244	23.458	1.304	0.000	0.965
unempl.:	2667	43564	2667	12747	0.018	0.012	1.777	1.365	23.458	1.304	0.000	0.965
empl.:	2667	43564	2667	12747	-0.022	0.008	1.217	0.894	23.458	1.304	0.000	0.965
Low treatment disposition												
all types:	340	74383	340	1583	-0.017	0.034	2.237	0.867	15.003	4.011	0.000	0.809
unempl.:	340	74383	340	1583	0.002	0.032	2.166	0.965	15.003	4.011	0.000	0.809
empl.:	340	74383	340	1583	-0.047	0.021	1.392	0.794	15.003	4.011	0.000	0.809
High treatment disposition												
all types:	3133	31542	3133	4836	-0.002	0.013	2.237	0.766	12.474	1.243	0.000	0.795
unempl.:	3133	31542	3133	4836	0.003	0.012	2.166	0.888	12.474	1.243	0.000	0.795
empl.:	3133	31542	3133	4836	-0.009	0.007	1.392	1.314	12.474	1.243	0.000	0.795

Table reports selected statistics of the evaluation for subgroups and selected robustness checks;

[A]   j and i are indicators for the population (i = treated population; j = untreated persons)

[B]   ATT stands for the average treatment effect on the treated; the ATT is calculated on the basis of formula (4): $Pr(T^k \leq 36)$

[C]   the balancing property is calculated as the averaged mean standardized bias based on individual and regional variables as well as the three propensity scores

[D]   the test used is an F-test of the joint insignificance of all the regressors before and after matching

Source: IEB, own calculations

Table A.4c
Treatment effects for '*discretionary start-up support*' (sub groups and robustness checks)

Treatment / type of exit	on support[A] Nj	Ni	matched[A] Nj	Ni	ATT[B]	se	inference se^r/se I	se^r/se II	balance (MSB)[C] before	after	test[D] before	after
Single nearest neighbor												
all types:	17790	209040	17790	14578	0.001	0.006	3.633	1.175	24.747	0.657	0.000	0.574
unempl.:	17790	209040	17790	14578	0.013	0.005	2.329	1.325	24.747	0.657	0.000	0.574
empl.:	17790	209040	17790	14578	-0.016	0.004	1.942	1.210	24.747	0.657	0.000	0.574
Caliper matching												
all types:	17442	209040	17442	14432	0.002	0.006	3.633	1.189	24.747	0.623	0.000	0.506
unempl.:	17442	209040	17442	14432	0.013	0.005	2.329	1.284	24.747	0.623	0.000	0.506
empl.:	17442	209040	17442	14432	-0.014	0.004	1.942	1.078	24.747	0.623	0.000	0.506
Kernel PS-matching												
all types:	17790	209040	17790	14578	0.001	0.006	3.633	1.175	24.747	0.657	0.000	0.574
unempl.:	17790	209040	17790	14578	0.013	0.005	2.329	1.325	24.747	0.657	0.000	0.574
empl.:	17790	209040	17790	14578	-0.016	0.004	1.942	1.210	24.747	0.657	0.000	0.574
All, but excluding information												
all types:	7688	206189	7688	14064	0.007	0.008	3.118	0.937	25.954	0.575	0.000	0.996
unempl.:	7688	206189	7688	14064	0.019	0.007	2.108	0.891	25.954	0.575	0.000	0.996
empl.:	7688	206189	7688	14064	-0.015	0.005	1.756	1.094	25.954	0.575	0.000	0.996
Western Germany												
all types:	6019	164956	6019	11792	0.008	0.009	4.101	1.405	27.978	1.114	0.000	0.899
unempl.:	6019	164956	6019	11792	0.019	0.008	2.300	0.900	27.978	1.114	0.000	0.899
empl.:	6019	164956	6019	11792	-0.017	0.006	2.127	1.183	27.978	1.114	0.000	0.899
Western Germany excluding regions with high ESF state funding												
all types:	1673	35618	1673	6544	0.023	0.016	2.304	0.652	41.720	1.234	0.000	0.956
unempl.:	1673	35618	1673	6544	0.023	0.015	1.653	1.462	41.720	1.234	0.000	0.956
empl.:	1673	35618	1673	6544	0.002	0.011	1.006	0.821	41.720	1.234	0.000	0.956
Eastern Germany												
all types:	2614	41233	2614	6403	0.002	0.014	1.958	1.343	26.728	1.024	0.000	0.971
unempl.:	2614	41233	2614	6403	0.011	0.013	1.712	1.130	26.728	1.024	0.000	0.971
empl.:	2614	41233	2614	6403	-0.015	0.007	0.994	0.906	26.728	1.024	0.000	0.971
Male population												
all types:	7496	147369	7496	23522	0.008	0.008	3.217	0.988	25.531	1.113	0.000	0.302
unempl.:	7496	147369	7496	23522	0.022	0.007	2.114	0.972	25.531	1.113	0.000	0.302
empl.:	7496	147369	7496	23522	-0.015	0.005	1.685	1.370	25.531	1.113	0.000	0.302

Table A.4c
Treatment effects for '*discretionary start-up support*' (sub groups and robustness checks)   continued

Treatment / type of exit	on support[A] Nj	on support[A] Ni	matched[A] Nj	matched[A] Ni	ATT[B]	se	inference se^r/se I	inference se^r/se II	balance (MSB)[C] before	balance (MSB)[C] after	test[D] before	test[D] after
Female population												
all types:	4492	52832	4492	14652	0.013	0.010	2.157	0.989	23.808	1.359	0.000	0.553
unempl.:	4492	52832	4492	14652	0.023	0.009	1.634	0.902	23.808	1.359	0.000	0.553
empl.:	4492	52832	4492	14652	-0.004	0.007	1.350	0.949	23.808	1.359	0.000	0.553
Low treatment disposition												
all types:	428	88513	428	2378	0.039	0.030	3.633	0.884	10.112	1.963	0.000	1.000
unempl.:	428	88513	428	2378	0.065	0.027	2.329	0.937	10.112	1.963	0.000	1.000
empl.:	428	88513	428	2378	-0.025	0.017	1.942	1.081	10.112	1.963	0.000	1.000
High treatment disposition												
all types:	6044	34157	6044	10038	0.004	0.009	3.633	1.236	6.840	0.579	0.000	1.000
unempl.:	6044	34157	6044	10038	0.025	0.008	2.329	1.195	6.840	0.579	0.000	1.000
empl.:	6044	34157	6044	10038	-0.017	0.006	1.942	1.377	6.840	0.579	0.000	1.000

Table reports selected statistics of the evaluation for subgroups and selected robustness checks;

[A]   j and i are indicators for the population (i = treated population; j = untreated persons)

[B]   ATT stands for the average treatment effect on the treated; the ATT is calculated on the basis of formula (4): $Pr(T^k \leq 36)$

[C]   the balancing property is calculated as the averaged mean standardized bias based on individual and regional variables as well as the three propensity scores

[D]   the test used is an F-test of the joint insignificance of all the regressors before and after matching

Source: IEB, own calculations

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