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Which firms train disadvantaged youth?

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Abstract:

The integration of disadvantaged youth into the labour market is a challenging policy issue. Since young people gain most from work experience and learning provided by firms, hence within apprenticeships, firms play a crucial role in training disadvantaged youths. Knowing firm characteristics that moderate the selection of firms in such training schemes might help to design more effective and efficient policy measures. This paper estimates the determinants of firms that participate in a training programme for disadvantaged youth in Germany. The paper shows that firms with greater training capacity in terms of full-time instructors and own training facilities and firms willing to invest own additional resources in the training of disadvantaged youth are more likely to participate in this training scheme. On the contrary, firm size, an increasing demand for skilled workers and difficulties in finding apprentices do not influence the participation.

Keywords: disadvantaged youth, apprenticeship, policy evaluation

JEL Codes: J24, M53, M51

1. Introduction

Governments in advanced economies spent millions of Euros on a wide range of programmes aimed at integrating disadvantaged youths into the labour market. Disadvantaged youths face a higher probability to be unemployed and longer unemployment duration in early adulthood (Caspi et al., 1998). Early unemployment experience during teenage years is strongly correlated with more frequent and longer unemployment spells later in life (Gregg, 2001). Moreover, disadvantaged youths are more likely to end up in unskilled jobs (Andrews et al., 2002) and have a higher propensity to commit criminal activities (Schochet et al., 2008).

The early identification of disadvantaged adolescents and their skill development is generally a favourable approach for preventing consecutive costs for society. Therefore, the government runs several programmes to foster a smooth transition into skilled jobs for disadvantaged youths. The school-to-work transition of disadvantaged youths is a major challenge even in countries with a well-developed apprenticeship training system, although those countries face fewer problems with the school-to-work transition than countries with a school-based system (Ryan, 1998; Ryan, 2001; Wolter and Ryan, 2011)[1]. In countries with a well-developed apprenticeship training system, the most common policy programmes are subsidised firm-focused apprenticeships, pre-vocational training schemes and full-time training in vocational colleges (Bonin et al., 2010).

Training in firms is generally considered to be the most promising approach to promote the acquisition of social skills and vocational qualifications, particularly for disadvantaged youths. Young people gain most from the closeness of work experience and learning provided by firms (Dolton et al., 1994; Ryan, 2011).[2] Implementing such programmes requires, indeed, the cooperation of training firms. Knowing moderating firm characteristics that lead to firms' participation in disadvantaged youth training schemes may be rewarding for designing and improving effective policy measures for such firm-based apprenticeships. Moreover, some of those firm characteristics such as firms' realisation of apprenticeship training are usually unobserved in the most evaluation studies that are based on administrative data even if they may also moderate the heterogeneity of programme effects.

This paper describes the characteristics of firms that participate in a subsidised enterprise-focussed training scheme for disadvantaged youths. The programme defines disadvantaged

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[1] In Germany, adolescents without a high-school degree face a probability to be unemployed 2.3 times higher and adolescents without an apprenticeship degree face a probability 2.7 times higher than adolescents with the respective degrees.

[2] Ryan (2011) collects pedagogical benefits of situated learning and describes motivational and cognitive advantages for apprentices compared with full-time students in vocational colleges.

youths as school-leavers who have the cognitive capabilities to successfully pass an apprenticeship but lack the non-cognitive skills necessary to be recruited as apprentices in firms, such as reliability, resilience or adequate demeanour[3]. The programme supports training firms with counselling for the disadvantaged apprentices. The counsellor should, in addition to the vocational qualification, influence and develop social skills and behaviour of the disadvantaged youth[4].

The paper shows that firms are more likely to participate in the training scheme when they are willing to bear additional resources to train disadvantaged youths and have greater training capacity in terms of full-time instructors or training facilities. On the contrary, firms facing difficulties to recruit apprentices are less likely to participate, even if the programme introduces an opportunity to cope with the school-leaver shortage. Moreover, firm size and a growth in apprenticeship positions reflecting an increasing demand for skilled workers do not affect the programme participation.

The paper is structured as follows. The second section describes the programme and the third the data and variables. The fourth shows the empirical results, and the last section concludes.

2. Programme description

The paper analyses a subsidised training programme for disadvantaged youth implemented by the employer association of the metal and electronic industry in Baden-Wuerttemberg, the state with the highest industry share on GDP in Germany. The programme defines disadvantaged youth as school-leavers who have the cognitive capability for an apprenticeship in blue-collar manufacturing occupation but lack the non-cognitive skills necessary to meet the recruiting requirements of training firms. To identifying the lack of non-cognitive skills, the programme uses a wide catalogue of disadvantage criteria ranging from behavioural problems such as truancy in school, drug use and criminal activities, up to a disadvantaged parental background such as long-term unemployed parents, alcohol dependency of one parent and migration background. These youths mostly have not sufficiently invested in non-cognitive skills such as reliability and adequate demeanour

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[3] The definition of disadvantaged youth is ambiguous in the literature. Most evaluations of youth training schemes focus on active labour market programmes and define disadvantaged youth as unemployed adolescents under 25 (Dolten et al., 1994, Katz, 1998; van Reenen, 2004; Dorsett, 2006; Caliendo et al., 2011; Fries et al., 2011). This definition comes close to the broader definition of disconnected youths meaning youths who do not attend school and are not employed (MaCurdy et al., 2006; Pfeiffer and Seiberlich, 2011). These definitions relate disadvantage to structural deficits. On the contrary, Andrews et al. (2002) and Schochet et al. (2008) refer to disadvantaged criteria as individual deficits. Their definition comes close to the one used in the programme.
[4] Brunello and Schlotter (2011) summarise policy interventions designed to improve non-cognitive skills.

towards colleges and supervisors making team production more challenging and resilience, self-discipline and self-reflection, all of which lead to difficulties for vocational skill acquisition.

Firms usually refrain from training disadvantaged youths lacking such non-cognitive skills because these youths demand more supervision and, hence, higher training costs than "regular" apprentices. Even if firms can adequately train disadvantaged youths in occupational topics, they have limited pedagogical expertise and capacity for influencing social skills and behaviour of disadvantaged youths. Therefore, the programme supports training firms with counselling advice and sponsors social counsellors. Each counsellor takes care for up to 15 disadvantaged youths. The social worker usually meets the apprentice every second week for two hours to train and develop non-cognitive skills. The educational institute of the employer association checks if the youth are eligible for the programme and is commissioned to match establishments and disadvantaged youths. The programme started in autumn 2009, and most of the apprentices still attend the training at the end of the first training year.

Although the programme targets only apprenticeships in blue-collar manufacturing occupations in one German state, the programme gives valuable insights into characteristics of firms participating in such training schemes. First, blue-collar manufacturing occupations are the most training investment-demanding occupations in the apprenticeship training system and require 7,000-8,000 Euro net training cost (Schoenfeld et al. 2010) [5]. If firms in these expensive training occupations can effectively integrate and train disadvantaged youths, apprenticeships in less net-cost demanding occupations should also be possible. Second, blue-collar-manufacturing occupations belong to the more intellectual challenging apprenticeships (Stalder, 2005). If firms train disadvantaged youth even in such occupations, the findings can be considered as a lower bound for firms` willingness to provide apprenticeship positions for disadvantaged youth. Third, even though the employer association implements the programme, incentives for firms and the design of the programme are similar to government-ran interventions (Bonin et al. 2010). Fourth, the fact that only member firms of the employer association are eligible for this programme does not limit the generalisation of the findings. The membership probability as well as the probability to participate in the programme increase with firm size. Nevertheless, firms belonging to an employer association may be a positive selection of all firms in terms of their responsibility to train disadvantaged youth. This positive selection particularly influences the control group if we assume that characteristics of participating firms do not differ by membership status.

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[5] Moreover, Mohrenweiser and Zwick (2009) show that training apprentices in blue-collar manufacturing occupations lowers the short-term profits for training firms.

Hence, the findings are again more likely to represent a lower bound. Finally, focussing on firms in one sector additionally increases the homogeneity of our estimation sample.

In the scope of government programmes aimed at integrating disadvantaged youth in the labour market, this programme can be characterised as an early intervention of a specific targeted group. The programme differs in the definition of disadvantaged youth from active labour market programmes that usually condition on unemployment or disconnectedness (see also footnote 3). Unemployment and disconnectedness are, however, likely rooted in insufficient non-cognitive skills - the disadvantaged criteria of the programme, even in younger age (Caspi et al. 1998).[6] The programme aims to reduce the probability of unemployment in early adulthood through skill development. Public-sponsored training programmes aiming to support the transition of youths in full-time employment have a mixed record but are more favourable regarding specific target groups of disadvantaged youth (Katz, 1998; Schochet et al., 2008).

However, the results of evaluation studies can strongly be driven by the definition of disadvantaged youth and country-specific institutions. Evaluation studies rely on different dimensions of disadvantage criteria: individual deficits such as cognitive and non-cognitive skills, institutional deficits such as early tracking and socio-economic inequality such as the parental background (Pohl and Walther, 2007). To the best of my knowledge, no study analyses the effectiveness different policy intervention concerning varying disadvantaged criteria[7].

3. Data and Variables:

Data. The paper uses the Establishment Survey 2010 of the employer association of the metal and electronic industry in Baden-Wuerttemberg (SWM: *SUEDWESTMETALL*). This cross-section survey interviews personnel managers or general managers in member firms of the employer association. The employer association sends the questionnaire to all member firms each year. In 2010, 531 establishments answered the questionnaire, which corresponds to a response rate of 70 percent.

The dataset is ideal to test our hypotheses because of its detailed information on establishments' realisation of apprenticeship training. Furthermore, the data contain all establishments participating in the training scheme for disadvantaged youth. Given that we are interested in apprenticeship training establishments, we drop non-training

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[6] Niepel (2010) shows that even lower non-cognitive skills at the age of 7 increases the probability of longer unemployment in early adulthood.
[7] Pohl and Walther (2007) discuss the differences in European school-to-work transitions regimes concerning disadvantaged youth criteria.

establishments, leaving us with 459 establishments for which we have information on all variables of interest[8].

Variables. Table A1 in the appendix summarises the definition and sample means of the dependent and explanatory variables. The dependent variable is a binary variable indicating the participation of an establishment in the training scheme for disadvantaged youth.

The first set of explanatory variables describes the capacity of training establishments to train disadvantaged apprentices. The intuition behind this variable is that the training of disadvantaged youths requires more resources, e.g. repeated instructions and more supervision, since such adolescents are more inclined to disciplinary problems, lower self-discipline and lower resilience. Nevertheless, training resources such as training workshops and full-time training supervisors are fix costs for training firms and the economy of scale allows firms with more training capacity to train more apprentices and to be more likely capable to integrate disadvantaged youth. Even if training of disadvantaged youth require more resources, a larger training capacity leads to a lower increase in the variable costs of training. Moreover, if hiring disadvantaged youth is risky, the problems associated with making a hiring mistake may be proportionally smaller for these firms (Bishop and Montgomery, 1986). Establishments' training capacity comprises five variables describing the equipment and personnel resources of the training establishments. Training establishments report whether they have an apprenticeship workshop, full-time training instructors, whether a training instructor is member of the apprenticeship examination committees in the chamber of industry and commerce, whether the training instructors keep close contact to the vocational school, and whether the establishment provides additional training courses[9]. These five variables can be used to form a one-dimensional measure named the training capacity. A principal component analysis calculates an eigenvalue of 2.91, the only greater than one, with factor loadings between 0.60 and 0.82. The five variables related to the training capacity have an internal reliability of alpha equal to 0.77. The Kaiser-Meyer-Olkin criterion also confirms the fit of the correlation matrix with values between 0.70 and 0.82. I create a weighted capacity score, using the scoring coefficients, with zero mean and standard deviation of one.

The second set of explanatory variables captures establishments' willingness to invest additional own resources to train disadvantaged youth. The dummy variable records whether an establishment is willing to hire adolescents with disciplinary problems or less favourable school grades even without additional support through such a programme. However, only the former reason refers to the required disadvantaged criteria of the programme. The

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[8] The difference entails 26 non-training firms and 46 firms with missing values.
[9] Appendix Table A3 displays the mean of the individual items by participation.

willingness to invest additional resources in training of disadvantaged youth can reflect a social orientation of a firm which may serve as a signal as a careful employer in the regional labour market. Such a signal may lead to advantages in hiring skilled workers (Backes-Gellner and Tuor, 2010).

The third set of explanatory variables refers to the general selection or recruiting criteria of training establishments. Some firms may require good school marks in math and adequate behaviour of adolescents. These firms may be less likely to convince to participate in the programme. Similarly, firms may not participate if they require adequate behaviour but are willing to teach basic math. On the contrary, a firm requiring good marks in math but can deal with adolescents lacking adequate demeanour may be willing to participate. The questionnaire contains questions on the most important competencies and skills that an establishment demands for prospective apprentices using a four-range Likert scale. A principal component analysis with varimax rotation extracts two factors: the first comprises non-cognitive skills such as team-orientation, adequate demeanour, self-discipline and self-reflection. The second entails school grades only. The eigenvalues for both factors are 2.3 (non-cognitive skills) and 1.1 (school grades). For the non-cognitive skills, the factor loadings lie between 0.71 and 0.81 and the Kaiser-Meyer-Olkin criteria between 0.69 and 0.81. Cronbachs alpha equals 0.76. For the non-cognitive skills, I calculate a score similar to the capacity score and for the school-grades, a standardised coefficient with mean zero and standard deviation one.

The fourth set of explanatory variables comprises establishments' difficulties in finding apprentices. Establishments facing recruiting difficulties might be inclined to lower their screening criteria and be more likely to participate in a training programme for disadvantaged youth. I use two measures for recruiting difficulties; first, an objective measure for whether the establishment was not able to fill all training places. This dummy variable is equal to one if at least one apprenticeship position remained vacant. Second, I use a subjective measure for whether the establishment faces general difficulties to attract apprentices. This dummy is equal to one if the establishment asses huge or very huge difficulties to find apprentices on a four-range Likert scale.

Appendix Table A2 displays the pairwise correlations between the main explanatory variables. The training capacity is negatively correlated with firms' willingness to provide no additional resources for training disadvantaged youth. Several firms seem to follow either a strategy to invest a lot of resources in the apprenticeship training and other firms seem to hold the training investments low. Moreover, firm size is positively correlated with training capacity. Furthermore, difficulties in recruiting apprentices are negatively correlated with firms' willingness to provide no additional resources to train disadvantaged youth. Firms

seem to be willing to invest more resources in apprenticeship training if they face recruitment difficulties.

Additionally, I use a number of control variables. First, establishment size capture the effect that bigger establishments usually have more financial resources for apprenticeship training and can attract apprentices more easily (Schoenfeld et al. 2010) so that they can draw from a larger pool of applicants (Bishop and Montgomery, 1986). Second, a dummy variable measures whether the establishment offers two year apprenticeships that usually require fewer competencies. Disadvantaged youths may be more likely to choose a two year apprenticeship. Third, a dummy variable captures expected growth of apprenticeships in blue-collar manufacturing occupations in the following years. This variable measures expected employment growth and a rise in the number of retiring workers who have to be replaced. Fourth, two variables capture the retention of apprenticeship graduates during the last year. One dummy variable equals one if at least one apprenticeship graduate has voluntarily left the training establishment after graduation last year[10]. Such behaviour may be a hint of insufficient screening or poor working conditions in the training establishment. The other dummy is equal to one if the establishment offered all apprenticeship graduates a permanent employment contract immediately after graduation last year[11] and captures establishments' opportunity to offer superior contracts. Fourth, a dummy variable captures whether an apprentice dropped out during the last three years.

4. Findings

Descriptive statistics. Table 1 shows the descriptive statistics for participating and non-participating establishments. 12 percent of the training establishments train disadvantaged youths in the scope of this programme. These establishments are larger and report a higher capacity to train apprentices and are more frequently inclined to invest additional resources in the training of disadvantaged youths. Moreover, participating establishments use more often school-grades instead of non-cognitive valuations to screen potential apprentices. Contrary, a t-test detects no significant differences by participation status concerning reported drop-outs, planned increase in the number of apprentices and reported problems to find apprentices, measured with a subjective assessment or an objective criterion. Moreover, appendix Table A3 displays the individual items of the scores by participation.

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[10] The collective bargaining contract in the metal and electronic industry requires the retention of all apprenticeship graduates for at least one year, subjected to firm-specific arrangement in exceptional circumstances. Immediate switches are, therefore, assumed to be initiated by the apprentices.
[11] The collective bargaining requires only one year fixed-term retention. Offering permanent contracts for all apprentices is likely to reflect a retention strategy of the firm.

Table 1: Descriptive statistics for participating and non-participating establishments.

Variable	Participants (Mean, Std. Dev)		Non- Participants (Mean, Std. Dev)		T-Test
Capacity Score	0.482	0.643	-0.064	1.021	3.43***
No Additional Resources (d)	0.314	0.468	0.684	0.465	2.90***
School Grades Relevant	0.289	1.069	-0.038	0.985	1.72*
Non-Cognitive Skill Relevant (Score)	0.094	0.928	-0.012	1.009	0.59
Objective Recruitment Difficulties (d)	0.129	0.339	0.173	0.378	0.39
Subjective Recruitment Difficulties (d)	0.166	0.376	0.232	0.423	0.56
Firm Size	1345	2138	908	4883	44.72***
Two-Year Apprenticeships (d)	0.204	0.406	0.116	0.321	0.76
Growth of Apprenticeships	0.166	0.376	0.249	0.433	0.71
Immediately Leaving Apprentices (d)	0.333	0.475	0.256	0.437	0.60
Permanent Jobs Offered (d)	0.111	0.317	0.099	0.298	0.12
Drop-Outs (d)	0.277	0.452	0.170	0.376	0.88

54 participating and 405 non-participating firms; d = Dummy variable, * p<0.1, ** p<0.05, *** p<0.01; source: SWM Establishment Survey 2010.

Results. Table 2 shows the estimates of the determinants for participating in the disadvantaged youth training scheme using a Probit ML approach with robust standard errors. The first column presents the coefficients of the preferred estimation and the second the marginal effects calculated at the sample means. The third column replaces the objective measure that a establishment faces problems to recruit apprentices with a subjective assessment. The fourth column presents a regression without establishments' main recruiting criteria because these may correspond to the programme's definition of disadvantaged youth, that school-leavers are eligible who have the cognitive capabilities to successfully pass an apprenticeship but lack the non-cognitive skills to be recruited as apprentices.

Training establishments that are not willing to invest own additional resources in the training of disadvantaged youth have a lower probability to participate in the training scheme. Those establishments are 12 percentage points less likely to train disadvantaged youth in the scope of this training scheme which is the strongest marginal effect. Moreover, training establishments with a higher capacity for apprenticeship training are more likely to participate in the disadvantaged youth training scheme. A training capacity one standard deviation higher increases the likelihood of programme participation by around three percentage points. Furthermore, emphasising school grades as the main selection criteria for apprentices is positively associated with participation, and emphasising more non-cognitive skills has no influence on participation. An interesting result is that neither establishment size nor establishments' assessment of difficulties in order to find adequate apprentices nor firms

expected demand-increase for apprentices have an additional impact on participation. Establishments facing recruitment difficulties seem not to valuate this programme as an adequate tool for solving the problems. This holds for the objective (column 1) and subjective measure (column 3) of recruitment difficulties. The results remain robust if I estimate the programme participation without the variables related to the programme's selection definition of disadvantage (column four). All remaining control variables show no significant influence.

Table 2: Determinants of firms' participation in a training scheme for disadvantaged youth.

	(1) Coef.	(2) dydx	(3) Coef.	(4) Coef.
Capacity Score	0.268**	0.032*	0.261**	0.274**
	(2.15)	(1.66)	(2.11)	(2.26)
No Additional Resources (d)	-0.865***	-0.126**	-0.872***	-0.773***
	(4.86)	(2.18)	(4.95)	(4.60)
School Grades Relevant	0.228***	0.027*	0.230***	
	(2.72)	(1.87)	(2.74)	
Non-cognitive Skills Relevant (score)	-0.037	-0.004	-0.026	
	(0.48)	(0.47)	(0.33)	
Objective Recruitment Problems (d)	-0.350	-0.035		-0.381*
	(1.46)	(1.50)		(1.65)
Subjective Recruitment Problems (d)			-0.322	
			(1.54)	
Firm Size / 1000	0.221	0.026*	0.204	0.215
	(1.45)	(2.50)	(1.36)	(1.41)
Firm Size squared / 100,000	-0.010	-0.001	-0.009	-0.009
	(0.71)	(0.98)	(0.65)	(0.62)
Two-Year Apprenticeships (d)	0.076	0.009	0.109	0.044
	(0.31)	(0.29)	(0.44)	(0.18)
Growth of Apprenticeship positions (d)	-0.191	-0.021	-0.221	-0.179
	(0.87)	(0.88)	(1.00)	(0.83)
Immediately Leaving Apprentice(s) (d)	-0.244	-0.026	-0.223	-0.230
	(1.11)	(1.19)	(1.02)	(1.08)
Permanent Jobs Offered (d)	-0.174	-0.018	-0.212	-0.114
	(0.68)	(0.74)	(0.82)	(0.45)
Drop-Outs (d)	-0.003	-0.000	-0.014	0.020
	(0.01)	(0.01)	(0.06)	(0.09)
Constant	-0.812***		-0.784***	-0.838***
	(4.73)		(4.59)	(5.08)
Pseudo R-square	0.17	0.17	0.17	0.15
Number of Observations	459	459	459	459

Dependent variable: training firm participates in the disadvantaged youth training scheme; robust t-values in parentheses, marginal effects in column two are calculated at the sample means, d = Dummy variable, * p<0.1, ** p<0.05, *** p<0.01; source: SWM establishment data 2010.

Furthermore, I investigate the influence of firm size on programme participation concerning the association between establishment size, establishments' training capacity and willingness to provide additional resources to train disadvantaged youth. If larger firms are more likely to employ full-time instructors and an apprenticeship workshop, for instance, controlling for training capacity may capture the firm size effect that is usually found in evaluation studies of enterprise-focussed disadvantaged youth training schemes (Fries et al., 2011). Moreover, if larger firms are more likely to use apprenticeship training as a signal of a social-oriented employer, firm size may capture the effect of firm willingness to cope with disadvantaged youth. Establishment size is usually observable in datasets used to evaluate enterprise-focussed apprenticeship training schemes but training capacity and the willingness to cope with disadvantaged youth is usually not. Table 3 repeats the estimation without training capacity and establishments' willingness to provide additional resources to train disadvantaged youth. The firm size is now a statistically significant participation criterion but the marginal effect remains economically negligible. Increasing the number of employees from 500 to 1,900 employees raises the probability of programme participation by three percentage points. Such an employment increase has the same effect as a one standard deviation increase in the training capacity. The growth of apprenticeship positions and the objective recruitment problems are not affected by this exercise. However, firm size can partly proxy the influence of firm realisation of apprenticeship training on the participation in a disadvantaged youth training programme.

Table 3: Determinants of firms' participation in a training scheme for disadvantaged youth: robustness of firm size effects.

	(1) Coef.	(2) dydx
Firm Size / 1000	0.344**	0.038**
	(2.39)	(2.39)
Firm Size squared / 100,000	-0.021	-0.235
	(1.19)	(1.45)
Controls	Yes	Yes
Pseudo R-square	0.08	0.08
Number of Observations	459	459

Dependent variable: training firm participates in the disadvantaged youth training scheme; control variables: non-cognitive skill score, school grade, objective recruitment problems, two year apprenticeship, growth in apprenticeship positions immediately leaving apprentices, permanent job offers and drop outs, robust t-values in parentheses, marginal effects in column two are calculated at the sample means, * $p<0.1$, ** $p<0.05$, *** $p<0.01$; source: SWM establishment data 2010.

A number of further robustness checks are presented in the appendix Table A4. The findings are robust in respect to replacing the quadratic establishment size with establishment size dummies, modelling a linear firm size effect, dropping the one percent biggest firms and

replacing the weighted scores by total scores assuming equal weight of each item. Moreover, the appendix Table A4 shows the influence of each key variable separately.

5. Conclusions

This paper analyses the selection of firms in a disadvantaged youth training scheme. Governments spend millions of Euros in programmes aimed at helping disadvantaged youth to acquire marketable skills and to support the transition into full-time employment. Training in firms is generally considered to be the most promising approach. Young people benefit from the closeness of production and learning provided by apprenticeship training in firms. Creating effective and cost-efficient programmes remain a major interest, but the firm is the critical actor.[12]

The findings show that neither labour market shortages such as difficulties in finding apprentices nor firm size nor an expected growth of apprenticeship positions reflecting firms expected demand for skilled workers affect the programme participation. Particularly firms facing recruiting difficulties seem not to value the programme as an opportunity to cope with such problems.

The findings also show that programme participation is associated with firms' capability and willingness for handling with disadvantaged youth. Firms with the capacity and willingness to cope with disadvantaged youth could be specifically addressed in policy interventions focussing on the skill acquisition of disadvantaged youth.

Moreover, evaluation studies can usually only control for the number of employees whereas firms' realisation of apprenticeship training remains a black-box. As the realisation of apprenticeship training is suspected to influence the participation in a programme for integrating disadvantaged youth and the retention of apprentices for example, a selection problem may occur. The findings of these study show that firm size can indeed partly capture the effect of firms' capacity to train.

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[12] However, several authors pose serious doubts on the capacity of enterprises to care for disadvantaged youth (Pohl and Walther, 2007). The paper does not try to discuss the disadvantaged criteria that may lead to beneficial and unfavourable outcomes of enterprise-focused youth training schemes.

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Appendix

Table A1: Variable description and sample descriptive.

Variable	Description (mean, standard deviation)
Programme Participation	Dummy variable equal to one if the firm participates in the training scheme for disadvantaged youth (0.117 0.322)
Capacity Score	Weighted score of firm's training capacity[13] (0.00 1.00).
No Additional Resources	Dummy variable equal to one if the firm is not willing to invest additional resources for disadvantaged youths (0.641 0.480).
School Grades Relevant	Standardised score about the relevance of school grades for recruiting of apprentices. The score is based on a four- range Likert scale from "very relevant" to "not relevant" (0.00 1.00).
Non-Cognitive Skills Relevant (Score)	Weighted score of the relevance of non-cognitive skills for the recruitment of prospective apprentices.[14] (0.00 1.00)
Objective Recruitment Difficulties	Dummy variable equals to one if the firm had at least one vacant apprenticeship position in the previous year (0.167 0.374).
Subjective Recruitment Difficulties	Dummy variable equals to one if the firm face huge and very huge difficulties to find new apprentices in the previous year. Answers based on a four-range Likert scale (0.224 0.412).
Firm Size	Number of employees (959 4645).
Two-Year Apprenticeships	Dummy variable equal to one if the firm offers two-year apprenticeships (0.126 0.332).
Growth of Apprentice-ships Positions	Dummy variable equal to one if the firm expects an increasing number of apprentices in the following year (0.238 0.427).
Immediately Leaving Apprentices	Dummy variable equal to one if at least one apprenticeship graduate left the firm immediately after the apprenticeship in the previous year (0.266 0.442).
Permanent Jobs Offered	Dummy variable equal to one if the firm offers all apprenticeship graduates a permanent job immediately after graduation in the previous year (0.100 0.301).
Drop-Outs	Dummy variable equal to one if at least one apprentice dropped out before the final exam during the last three years (0.183 0.387).

N = 459, Source: SWM establishment panel 2010.

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[13] The score contains answers on the following five binary questions: whether the firm has an apprenticeship workshop, whether the firm has full-time training instructors, whether the training instructors are members of the examination committee in the chamber of industry and commerce, whether the training instructors keep close contact to the vocational school, and whether the firm provides additional training courses.

[14] The score contains firm's valuation of the relevance of the four non-cognitive skills team-orientation, demeanour, self-discipline and self-reflection for the hiring decision of prospective apprentices. Answers crossed on a four-range Likert scale.

Table A2: Correlation between the explanatory variables.

	Capacity Score	Additional Resources	Grades relevant	Non-cognitive rel.	Objective Rec. Diff.	Subjective Rec. Diff.	No. Employees
Capacity Score	1.000						
No Additional Resources	-0.218	1.000					
School grades relevant	0.028	0.093	1.000				
Non-cognitive skills relevant	0.078	-0.092	0.056	1.000			
Objective Recruiting Difficulties	0.045	-0.113	-0.038	-0.004	1.000		
Subjective Recruiting Difficulties	-0.027	-0.109	-0.061	0.052	0.360	1.000	
Number of Employees	0.1224	-0.077	0.088	0.081	-0.015	-0.039	1.000

N = 459, Source: SWM Establishment Survey 2010.

Table A3: Answers of the individual items by programme participation

Description	Participating Firm (N = 54)	Non-Participating Firm (N = 405)
Capacity Score		
Training instructors are members of the examination committee in the chamber of industry and commerce	0.926	0.778
Training instructors keep close contact to the vocational school	0.963	0.879
Full-time training instructors	0.796	0.575
Apprenticeship workshop	0.907	0.684
Firm provides additional training courses	0.870	0.684
Non-cognitive skill score		
Team-orientation	3.46	3.40
Adequate demeanour	3.38	3.34
Self-discipline	3.33	3.33
Self-reflection	3.51	3.45

Source: SWM Establishment Survey 2010.

Table A4: Determinants of selection in the training programme.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capacity Score (weighted)	0.339**	0.256**		0.305***				
	(2.61)	(2.13)		(2.77)				
Capacity Score (total)			0.174**					
			(2.23)					
No Additional Resources	-0.851***	-0.843***	-0.863***		-0.762***			
	(4.87)	(4.80)	(4.85)		(4.50)			
School Grades Relevant	0.228**	0.212***	0.229***			0.169**		
	(2.75)	(2.58)	(2.72)			(2.18)		
Non-cognitive Skills Relevant (weighted score)	-0.028	-0.050					0.042	
	(0.37)	(0.65)					(0.57)	
Non-cognitive Skills Relevant (total score)			-0.037					
			(0.48)					
Objective Recruitment Difficulties	0.336	-0.318	-0.351					-0.248
	(1.46)	(1.37)	(1.46)					(1.06)
Firm Size/ 1,000	0.007		0.218	0.254**	0.256**	0.301***	0.369**	0.368***
	(0.61)		(1.44)	(2.04)	(2.08)	(3.29)	(3.20)	(3.25)
Firm Size squared/ 1,000			-0.0001	-0.0001	-0.0001	-0.0001*	-0.0001*	-0.0001*
			(0.70)	(1.05)	(0.88)	(1.91)	(1.76)	(1.81)
100-249 Employees		0.067						
		(0.18)						
250-499 Employees		0.240						
		(0.65)						
500-999 Employees		0.217						
		(0.58)						
>1,000 Employees		0.570						
		(1.45)						

Two-year apprenticeships	0.116	0.028	0.077					
	(0.48)	(0.11)	(0.31)					
Growth of apprenticeship positions	-0.195	-0.202	-0.185					
	(0.89)	(0.93)	(0.84)					
Immediately Leaving Apprentice(s)	-0.180	-0.257	-0.245					
	(0.86)	(1.18)	(1.11)					
Dummy: immediate permanent job	0.114	-0.147	-0.172					
	(0.46)	(0.58)	(0.67)					
Drop-Outs	0.084	-0.003	-0.003					
	(0.41)	(0.02)	(0.01)					
Constant	-0.715***	-0.904*	-1.455***	-1.427***	-0.986***	-1.467***	-1.447***	-1.417***
	(4.46)	(2.55)	(4.27)	(12.94)	(6.66)	(13.80)	(13.88)	(13.50)
Pseudo R-sqr	0.16	0.16	0.17	0.08	0.12	0.07	0.05	0.06
Number of Observations	459	459	459	459	459	459	459	459

Dependent variable: training firm participates in the disadvantaged youth training scheme; robust t-values in parentheses,
Firm Size Reference in column (1) is smaller than 100 employees; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; source: SWM establishment data 2010.