

The Long-Term Effects of Start-Up Subsidies and the Role of Personality Traits

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Abstract

Start-up subsidies encouraging unemployed individuals to start their own business have become an important part of Active Labor Market Policy (ALMP) in many countries. In Germany, a new subsidy has been introduced in 2006 and this paper provides first empirical evidence on its long-term effects. Based on administrative data and a rich survey we apply propensity score matching and show that, even after 40 months, chances of reintegration into the labor market are significantly higher for participants than eligible non-participants. Besides, participants profit from a substantial income advantage compared to non-participants. In our sensitivity analysis, we address the concern about potential overestimation of the treatment effects due to positive selection by empirically analyzing the role and importance of personality characteristics. The analysis shows that the inclusion of the personality variables in the matching estimations leads only to minor and insignificant changes in the treatment effects.

Keywords: Start-up subsidies, self-employment, personality, evaluation

JEL codes: C14, H43, J68, L26

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1 Introduction

Start-up subsidies for unemployed individuals as part of active labor market policy (ALMP) have gained attention by policy-makers and researchers alike in recent years. While the empirical evidence indicates that traditional instruments of ALMP such as wage subsidies, vocational training, or job creation schemes overall show mostly disappointing impacts on the labor market outcomes of participants (Kluve and Schmidt, 2002; Lechner and Wunsch, 2008), previous evaluation studies of start-up subsidies find substantial positive impacts on employability and income. Caliendo and Künn (2011) examine the effects of two programs in Germany (bridging allowance and start-up subsidy) designed to help unemployed individuals start a new business. As comparison group, they use other individuals unemployed and eligible to participate during the same time. They find significant and substantial positive long-term effects with respect to the probability of being self- or regular employed as well as working and household income for West-German men. Although there is still only limited international evidence on this topic, the findings for various forms of start-up assistance to unemployed individuals so far indicate positive results overall (see, e.g., O’Leary et al., 1998, and O’Leary, 1999, for Hungary and Poland, Cueto and Mato, 2006, for Spain, or Rodriguez-Planas and Jacob, 2010, and Rodriguez-Planas, 2010, for Romania).

This paper provides first empirical evidence on the long-term effects of a new start-up subsidy program for the unemployed (“Gründungszuschuss”) which was introduced in Germany in 2006 and replaced the two programs analyzed by Caliendo and Künn (2011). The subsidy consisted of an amount equivalent to the person’s recent unemployment benefit and in addition a lump sum of 300 Euros to cover social security costs. We have rich survey and administrative data on a sample of participants and a comparison group of other eligible unemployed individuals. Applying a propensity score matching approach, we find evidence that even after 40 months, chances of reintegration into the labor market are substantially and significantly higher by 12 percentage points. Besides, participants have a large income advantage over matched non-participants.

In our extensive sensitivity analysis, we conduct several robustness checks with respect

to the matching algorithm and sample definition which confirm our results. Most importantly, we also explicitly examine the importance of omitted personality variables. Thereby, we take into account recent empirical evidence from the entrepreneurship literature stating that individuals who start their own business differ with respect to personality traits, non-cognitive skills and risk preferences, even after controlling for socio-demographic, labor market history information, and intergenerational determinants of self-employment.

In two meta-analytical surveys, Rauch and Frese (2007) and Zhao et al. (2010) stress the importance of personality with respect to entrepreneurial intentions and performance. In a recent empirical study, Caliendo et al. (2014) comprehensively and systematically analyze the impact of various personality characteristics on the probability of being self-employed using representative German data. They find evidence that the *Big five* (Costa and McCrae, 1992), a broad five-factor measure for personality with its dimensions conscientiousness, extraversion, agreeableness, neuroticism, and openness to new experiences, shows a significant correlation with entry into self-employment. In particular, the factor openness to new experience plays the most important role. A personality characteristic which also showed to be highly relevant in the decision to become an entrepreneur is the *locus of control*. In general, the locus of control measures the generalized expectations about the internal and external control of reinforcement (Rotter, 1966). A high internal locus of control implies that individuals attribute their future success or failure in life to their own actions while persons with a high external locus of control believe that their life's outcomes are controlled by external factors outside of themselves like fate or luck. Caliendo et al. (2014) find a positive effect of a high internal/low external locus of control on the probability of becoming an entrepreneur, which is in line with previous findings (e.g., Evans and Leighton, 1989). Furthermore, the literature emphasizes the role of *willingness to take risks* in the decision to become self-employed. It is argued that persons with a higher willingness to take risks are more likely to start a new business because it requires making risky decisions in uncertain environments (Caliendo et al., 2009). While empirical results indicate a general positive relationship between risk tolerance and en-

entrepreneurial intentions (Caliendo et al., 2009, 2014), the effect on entrepreneurial survival is found to be inverse u-shaped (Caliendo et al., 2010).

In the light of these findings, we address the concern that people who join the start-up subsidy program to start their own business out of unemployment might be systematically different in these personality dimensions. Since those variables are not observed in administrative records which are usually exploited to evaluate ALMPs, there might remain a positive selection into the start-up subsidy even after conditioning on traditional control variables like education, qualification, and labor market history. This might result in potential overestimation of the treatment effects. In this paper, we are in the rare position to also have access to a rich set of variables capturing personality characteristics and risk tolerance. We are the first to explicitly analyze the role and importance of these usually unobserved personality variables for the matching estimations by modeling the selection process with and without these variables and to examine the consequences for the estimated treatment effects. This new kind of sensitivity analysis shows that openness and locus of control have a significant influence on the selection into the start-up subsidy program. However, the inclusion of the personality variables in the matching estimations leads to only small and mostly insignificant changes in the treatment effects.

The availability of the personality variables in our data also allows us to have a closer look at effect heterogeneity with respect to personality. The expected relationship between the effectiveness of the start-up subsidy and higher degrees of particular personality characteristics is ambiguous and we are able to shed light on this topic by providing empirical evidence.

The rest of the paper is organized as follows. In section 2, we present the characteristics of the start-up subsidy program before outlining the estimation framework. Section 3 describes the data and presents some descriptive results. Section 4 contains the main results of the evaluation, the sensitivity analysis with respect to usually unobserved personality characteristics, and the findings from the effect heterogeneity analysis before section 5 concludes.

2 Start-Up Subsidies in Germany and Empirical Strategy

2.1 Institutional Details

The start-up subsidy in Germany (“Gründungszuschuss”, social code book III, §§57, 58) was introduced in August 2006¹ and thereby replaced two other ALMP programs intended to support business foundations out of unemployment, the bridging allowance (“Überbrückungsgeld”) and the former start-up subsidy (“Existenzgründungszuschuss”).²

[Insert Table 1 about here]

During the first five months after its introduction, 34,000 individuals joined the new start-up subsidy program (see Table 1). The number of entries increased to well over 120,000 unemployed in 2007 and peaked in 2010 with 147,000 people starting a subsidized business out of unemployment. Public expenditures on this program, in particular compared to other ALMPs, were substantial with 1.5 to 1.9 billion Euros per year.

Eligibility for the start-up subsidy depended on several requirements: At the start of the business, unemployed individuals had to have a remaining entitlement to at least 90 days of unemployment benefit I. Furthermore, a business and financing plan evaluated by an independent external institution (Chamber of Commerce, tax accountant, or the like) had to be submitted to the Employment Agency. The subsidy was paid for a maximum period of 15 months. The first period of SUS was nine months long and could be legally claimed by all eligible individuals who fulfilled the legal requirements. The SUS consisted of an amount equivalent to the person’s last unemployment benefit and a lump sum payment of 300 Euro per month for coverage of social security costs. The subsidy was offset against the remaining days of unemployment benefit I entitlement (Social code book III, §128 (1) 9). After these first nine months, participants could apply for a second period of additional six months which could not be legally claimed. The approval for the second period depended on a sufficiently high economic activity of the new business which was assessed entirely by

¹The start-up subsidy has been subject to substantial reforms in December 2011, see Bundesministerium für Arbeit und Soziales (2011) for details.

²See Caliendo and Kritikos (2010) and Caliendo and Künn (2011) for details on the bridging allowance and former start-up subsidy.

the respective case worker.

2.2 Estimation Framework

For the estimation of the causal treatment effects, we follow the literature and base our analysis on the potential outcome framework, also known as the Roy (1951)-Rubin (1974) model. The two potential outcomes are denoted as Y^1 (if the individual receives treatment, $D = 1$) and Y^0 (if the individual does not receive treatment, $D = 0$). The actually observed outcome for an individual i can be written as: $Y_i = D_i \cdot Y_i^1 + (1 - D_i) \cdot Y_i^0$. The individual treatment effect is defined as the difference in potential outcomes: $\Delta_i = Y_i^1 - Y_i^0$.

However, *both* potential outcomes for the *same* individual at the *same* time can in fact never be observed because the individual can either receive the treatment or not (“fundamental evaluation problem”). In our analysis, we follow previous studies and focus on the most prominent evaluation parameter, the average treatment effect on the treated (ATT), which is given by:

$$\Delta_{ATT} = E(Y^1 | D = 1) - E(Y^0 | D = 1). \quad (1)$$

The last term of equation (1) describes the counterfactual, unobserved outcome without treatment for actually treated individuals. Since the condition $E(Y^0 | D = 1) = E(Y^0 | D = 0)$ is usually not satisfied in absence of experimental data, estimating ATT by the difference in mean outcomes between participants $E(Y^1 | D = 1)$ and non-participants $E(Y^0 | D = 0)$ will lead to biased results. The bias arises due to selection into the treatment. Treated and control individuals are selected groups that would have different outcomes even in the absence of the program due to observable or unobservable factors.³

We apply propensity score matching and thus rely on the conditional independence assumption (CIA), which states that conditional on the propensity score $P(\cdot)$ as a function of observable characteristics X , the counterfactual outcome is independent of treatment: $Y^0 \perp\!\!\!\perp D | P(X)$, where $\perp\!\!\!\perp$ denotes independence (Rosenbaum and Rubin, 1983). In addition to the CIA, we also assume overlap: $Pr(D = 1 | P(X)) < 1$, for all X . The ATT is then

³See, for example, Caliendo and Hujer (2006) for further discussion.

identified as:

$$\Delta_{ATT}^{MAT} = E(Y^1|P(X), D = 1) - E_X[E(Y^0|P(X), D = 0)|D = 1], \quad (2)$$

where the first term can be estimated from the treatment group and the second term from the mean outcomes of the matched control group. The outer expectation is taken over the distribution of $P(X)$ in the treatment group.

The CIA is obviously a very strong assumption which relies heavily on the availability of relevant data (Lechner and Wunsch, 2013). In previous studies evaluating start-up subsidy programs for the unemployed, it has been argued that controlling for individual socio-demographic and qualification factors along with information on labor market history and parental self-employment makes it plausible that the CIA holds (Caliendo and Künn, 2011). So far, this point was reassessed by conducting various sensitivity analyses. In our study, we are in the position to have access to multiple usually unobserved personality variables that are relevant in the decision to start a business. Thus, apart from conducting conventional sensitivity analyses, we can estimate the treatment effects with and without explicitly including the personality traits and examine their relevance for the CIA.

3 Data and Descriptive Results

3.1 Data

We use a random sample of individuals who were unemployed and entered the start-up subsidy program in the first quarter of 2009 and compare them to other unemployed persons who were eligible to but did not start the program during the same period. We combine information from administrative records provided by the Federal Employment Agency (FEA) with survey data obtained by computer-assisted telephone interviews. The administrative part contains detailed information on employment, unemployment, and participation in active labor market programs including wages and unemployment benefits prior to the start-up subsidy. The administrative data were complemented by information on variables which are unavailable in the administrative records, e.g. parental self-employment. The survey data were collected in two waves. The first interviews were conducted in the last

quarter of 2010 so that the period between entry into the program and survey is roughly 21 months. A second interview wave was rolled out in August through October of 2012 after approximately 41 months of business start.

In addition and central to our sensitivity analysis, the second questionnaire contained items which measured various personality characteristics. The respondents were given a series of different statements about themselves and were asked how much they agreed with them. The Big five personality dimensions were constructed using ten items and a seven-point Likert scale. For the measurement of the locus of control, the questionnaire contained six items. Risk preferences were measured on a scale ranging from zero to ten where the lowest value indicated absolutely no willingness to take risks while the highest value represented a person with a high risk tolerance. The items and the construction of the variables are reported in Table A.1 in the Appendix.

The personality characteristics were surveyed during the second interview and thus recorded after the program start. Following the literature (e.g., Dohmen et al., 2007; Cobb-Clark and Schurer, 2013, 2012), we assume in our analysis that personality traits and risk attitudes are stable and thus not related to labor market events, i.e. unaffected by the treatment.

3.2 Descriptive Results

Our final estimation sample consists of 589 participants in the start-up subsidy program and 699 non-participants. Table A.2 in the Appendix presents descriptive statistics on socio-demographics, information on regional labor market classification, labor market history, as well as intergenerational information. Participants and non-participants show relatively well-balanced characteristics with respect to age, gender, and family situation.⁴ Individuals entering the subsidy program tend to have less formal and professional qualification. Comparing previous labor market experiences, participants have on average a more favorable employment history with respect to lifetime unemployment and time spent in

⁴This fact is due to pre-matching of participants and non-participants with respect to key socio-demographic characteristics.

regular employment during the three years prior to the unemployment spell leading up to the entry into the start-up subsidy program. They also tend to have been either regularly or self-employed before the unemployment spell more likely than non-participants. From the literature, we know that parental self-employment has an impact in the decision to start a business (Dunn and Holtz-Eakin, 2000). Almost one third of participants report that at least one parent is or was self-employed while the same is true for 30% of non-participants but this difference is not statistically significant at the 10% level.

[Insert Table 2 about here]

Table 2 summarizes the most relevant labor market outcomes in the short- and long-term for start-up subsidy participants who started their business in the first quarter of 2009 as well as for non-participants. In Panel A, we find that the short-term survival rate in self-employment is 83% 21 months after start of the program or, given a maximum duration of subsidy receipt of 15 months, this is equivalent to 6 months after the end of the subsidy. Since all participants are self-employed at the start of the program by definition, a comparison to the non-participants is only of little value. For our further evaluation analysis, we will therefore focus on another employment status. The main goal of ALMP is reintegration of unemployed individuals into the labor market, thus we have a closer look at the fraction of people who report to be self- or regular employed. The descriptive evidence shows that the fraction of participants in self- or regular employment 21 months after start is 93% while only 71% of non-participants are reintegrated into the labor market. As an alternative indicator for the success of the start-up subsidy program, we examine the reported monthly disposable working income. On average, participants report to earn roughly 1,930 Euros from self- and/or regular employment in the short run (after 21 months). In contrast, for the non-participants, the mean level is significantly lower with an amount of 1,180 Euros. The difference in median working income is less pronounced but still substantial with 1,500 for participants compared to 1,000 for non-participants. For household income, we obtain a similar picture. We should keep in mind, however, that the differences in incomes can be explained by two factors, an indirect

employment effect due to differences in employment rates, and a direct income effect due to differences in incomes between employed participants and non-participants.

In the long-term perspective (Panel B, Table 2), the survival rate in self-employment drops to 74% for participants while still 90% report to be in employment and only 4% are unemployed. Compared to non-participants, these numbers indicate a descriptive employment advantage of participants by 15 percentage points whereas the share of unemployed in the non-participants group is more than double with 9%. Although the employment gap between participants and non-participants is reduced in the long run, the income differences after 40 months are even more pronounced than in the short run with a gap of 845 Euros in working income and 735 Euros in household income. Still, these differences only represent raw gaps as we did not yet control for the factors determining labor market success or selection into the program.

4 Estimation Results

4.1 Propensity Score Estimation and Matching Quality

To estimate the causal effect of participation in the start-up subsidy program we conduct propensity score matching. We estimate the propensity score for participating in the program using a probit specification. We follow economic theory and previous evaluation studies of start-up subsidies for the unemployed and include the variables containing information about socio-demographics, regional labor markets, labor market history, and intergenerational transmissions in our probit specification. Detailed probit estimation results with the full set of coefficients can be found in the Appendix, Table A.3. We observe significant effects of education, lifetime unemployment, employment status before unemployment, income from last employment as well as regional labor market cluster on the decision to participate. In line with previous empirical findings in the literature, parental self-employment has a significant positive influence as well (Dunn and Holtz-Eakin, 2000).

[Insert Figure 1 and Table 3 about here]

Figure 1 shows the distributions of the propensity scores for participants and non-participants. The distributions are rather asymmetric between participants and non-participants and skewed towards the tails. This indicates that entry into the start-up subsidy program is selective and participants and non-participants systematically differ in observed characteristics. While participants have on average a higher probability of starting a subsidized business out of unemployment, we find individuals in both groups along the whole distribution of the propensity score.

Using the estimated propensity scores, we conduct epanechnikov kernel matching with optimal bandwidth based on leave-one-out cross-validation and impose the common support condition. Table 3 reports indicators which show a relatively good matching quality. While the characteristics of participants and non-participants differ significantly in the means of 53 of the total 82 covariates in the unmatched sample, the matching procedure leads to a relatively good balancing of all characteristics and we find only one significant differences at the 10% level in the average values in the matched sample (Panel A). The standardized bias as the difference of sample means for participants and non-participants divided by the square root of the average of sample variances in both groups (Rosenbaum and Rubin, 1985) is on average 7.9% before matching and decreases to 3.1% after matching confirming the good matching quality (Panel B). In line with these results, we find that the pseudo- R^2 (the p-value of joint significance) from a probit regression of the treatment indicator on all covariates (Sianesi, 2004) decreases from 0.1796 to 0.0162 (increases from under close to zero to 1). Thus, for the matched sample, the observable characteristics do have almost no power to predict participation in the start-up subsidy program (Panel C and D).

4.2 Treatment Effect Estimation

We now turn to our estimated treatment effects. We conduct epanechnikov kernel matching with common support and determine the optimal kernel bandwidth based on leave-one-out cross-validation.

[Insert Figure 2 and Table 4 about here]

Figure 2 shows the average treatment effect on the treated (cf. Equation 2) over time with respect to reintegration into the labor market (self- or regular employment). The effects are positive over the observed period of 40 months after the entry into the start-up subsidy program. The difference in probability to be regular or self-employed drops from 65% directly after the start of the program to 20% after one year and stabilizes in the area of 12-15% after two years until the end of the observation period. The 95% confidence bands remain well above zero indicating that the effects are significant throughout the 40 months observed.

Table 4 provides the exact numerical values for all outcome measures. Reintegration into self- or regular employment is 16.6 percentage points higher after 21 months and 11.9 points higher after 40 months due to the start-up subsidy with both findings being significant at the 1%-level. If we cumulate these effects over all observed months we find that participants spent on average close to 9 months more in self- or regular employment than matched non-participants. These positive and substantial results confirm previous findings for the preceding start-up subsidy programs in Germany (Caliendo and Künn, 2011).

With respect to income advantages of participants, we find a positive average total effect of the program on disposable monthly working income from self- or regular employment of 640 Euros in the short run which further increases to more than 770 Euros in the long run. Given a mean working income of 1,930 Euros after 21 months and 2,360 Euros after 40 months for participants, these impacts are very large. Taking the total income available to the whole respective household into account, the treatment effects are slightly less pronounced with a mean of 530 (short-term effect) and 580 Euros (long-term effect) but still large and highly significant.

In total, the different outcome measures draw a consistent picture and suggest that helping individuals to start a subsidized business out of unemployment yields substantial and significant positive impacts on employability and income, even in the long-term.

[Insert Table 5 about here]

The results are robust to various conventional sensitivity analyses with respect to choice of the kernel bandwidth, the definition of the estimation sample, the matching algorithm and, in the case of the cumulated employment effect, is further confirmed by two conditional difference-in-differences estimations (see Table 5).

4.3 Sensitivity with Respect to Usually Unobserved Variables

Recent empirical findings indicate that people who start their own business are systematically different in certain personality dimensions like openness to new experiences, locus of control, or risk attitudes (see, e.g., Zhao et al., 2010, or Caliendo et al., 2014). These variables have been shown to be important for entrepreneurial decisions and success but are usually unobserved in administrative records which are the basis of most evaluation studies of ALMP. In particular with respect to start-up subsidies, there is thus a serious concern that there remains positive selection into the program based on these unobserved personality variables even after matching on observables like education and employment history. As a consequence, participants would have higher outcomes even in absence of the program and the treatment effects would be overestimated.

In this study, our rich data allow us to address this concern by explicitly modeling the selection process without and with these personality characteristics for the first time. We use the specification without the personality variables as a baseline which represents conventional evaluation studies. By including information on the big five, locus of control, and risk attitudes, we can test the sensitivity of our estimation results with respect to these usually unobserved variables.

[Insert Table 6 about here]

Table 6 presents descriptive statistics for the variables on personality characteristics separately for participants and non-participants. The comparison of the average scores are in line with our expectations that participants are in total more entrepreneurial. With regard to the big five, participants rate themselves on average significantly more extraverted,

more confident and more open to new experiences. They report a significantly higher, i.e. more internal locus of control indicating that they believe more strongly that they can determine their future success by their own actions. Not surprisingly, participants also show a higher willingness to take risks on average. All in all, the descriptive analysis confirms that participants differ from non-participants with respect to key personality characteristics.

As a next step, we examine the importance of these personality characteristics in the selection into the start-up subsidy. As a baseline, we use the propensity score estimation from our main results. Then, we gradually add the personality variables to examine whether these characteristics affect the selection into treatment, conditional on the conventional control variables of our baseline specification. The estimation results are summarized in Table 7.⁵

[Insert Table 7 about here]

If we extend the baseline specification by the five personality dimensions known as the big five (Table 7, column (2)) we find that lower levels of neuroticism and higher levels of openness positively affect selection into the program. In column (3), we present the results for the base specification extended by the locus of control. Unemployed individuals with a higher locus of control are significantly more likely to participate in the program, conditional on all other observed control variables. If we add to our base specification the willingness to take risks in linear and squared form (Table 7, column (4)), we find that a higher risk tolerance positively affects selection into the treatment. The last column shows the probit estimation results for the baseline specification extended by all personality variables at hand. We find that the positive effect of openness to new experiences on the likelihood of participation remains highly significant. Also, our findings with respect to the locus of control are robust to the addition of other personality characteristics. Surprisingly, the impact of risk preference loses its significance in the extended model. To sum up, we find strong evidence that personality traits are highly relevant in the decision to start a subsidized new business out of unemployment.

⁵Detailed probit estimation results with the full set of coefficients for all specifications can be found in the Appendix, Table A.3.

We now analyze the sensitivity of the estimated treatment effects with respect to the inclusion of usually unobserved personality variables. Table 8 compares the estimated average treatment effects on the treated for the baseline specification (from Table 4) with those from the extended specification. It also reports the differences between the two effects and whether they are significant.

[Insert Table 8 about here]

While we found a 16.6 (11.9) percentage points higher probability for participants to be self- or regular employed after 21 (40) months in our baseline results, this effect slightly decreases to 16.4 (10.7) points after including the personality variables. For the cumulated effect over all observation periods, the effect drops by about third of a month to 8.4 months. Both differences are not significant at the 10%-level. With respect to the income measures, we observe a similar picture. The impact on disposable monthly working income is reduced from 640 to 580 Euros in the short run and from 770 Euros to 680 Euros in the long run, the gain in household income for participants over non-participants decreases from 530 to 440 Euros and from 580 to 490 Euros respectively. The differences in effects are mostly not or only weakly significant. These findings are overall robust to changes of the bandwidth (see Table 8).

To further test the sensitivity of our results, we restrict our sample to individuals aged 30 to 60 because the evidence for no systematical changes in personality variables is strongest for individuals during working age (Cobb-Clark and Schurer, 2013).⁶ Table 8 reports the estimated treatment effects for this subsample which confirm our previous findings.

The comparison of the estimated treatment effects of the baseline results and the extended specification shows a consistent picture. The inclusion of usually unobserved personality traits and risk tolerance reduces the estimated effects only moderately by mainly less than 10% while the differences in the effects are mostly not significant at conventional levels. Thus, there is evidence for no or only slight over-estimation of the treatment effects

⁶82 participants and 129 non-participants in our original estimation sample are outside this age range.

if we neglect the personality characteristics in the propensity score matching estimations.

4.4 Effect Heterogeneity with Respect to Personality

The availability of the personality variables in our data enables us to not only examine the sensitivity of the estimated treatment effects to the explicit inclusion of those variables in our matching approach. It also allows us to have a closer look at effect heterogeneity with respect to personality. In general, it is not obvious which kind of types of individuals benefit most from the start-up subsidy. Taking the locus of control as an example, there is a positive relationship between locus of control and business success (Rauch and Frese, 2000) on the one hand. On the other hand, there is evidence that more internal unemployed individuals have a higher job search intensity (Caliendo et al., *forthcoming*) and shorter unemployment spells (Uhlendorff, 2004) which implies that in the absence of the subsidy, more internal persons are more likely to find a job more quickly than more external individuals. In total, it is unclear which effect dominates and thus who profits most from the start-up subsidy.

[Insert Table 9 about here]

To empirically analyze the interaction between personality and the effectiveness of the start-up subsidy, we split the sample into three subsamples by the terciles of each personality variable in the participants group which represent a low, medium, and high degree of the respective trait. We then conduct the two-step propensity score matching procedure (propensity score probit estimation and kernel matching) for each separate subsample. Again, we run the estimations for the baseline specification with no further personality variables included as well as for the extended specification which contains all other personality characteristics.

The results for the outcome variable “self- or regular employed 40 months after start” are reported in Table 9. For the big five dimensions (Panel A) conscientiousness and extraversion, we find a u-shaped relation between each factor and the treatment effect in both specifications. For neuroticism and openness, we find no meaningful differences

between individuals with higher or lower degrees of these factors in the base specification. But once we control for the other personality characteristics, the more emotionally stable an individual is, the more they profit from the subsidy program. For openness, we find an inverse u-shaped pattern. In Panels B and C, we repeat the analysis for locus of control and risk tolerance. While for locus of control, we find an inverse u-shaped pattern, the relationship between readiness to take risks and the effectiveness of the program is positive. This implies that the subsidy is most beneficial to individuals with a medium locus of control and lower risk aversion.

5 Conclusion

In this paper, we analyze the long-term effects of a new start-up subsidy program in Germany on employability and income. The program provides financial assistance to unemployed individuals who decide to start their own business. Using combined data from administrative records and a rich survey, we apply propensity score matching to estimate the effectiveness of participation compared to non-participation up until 40 months after the entry into the program. In summary, we find that participation substantially increases reintegration into the labor market. Up until 3.5 years after entry into the program, participants spend on average close to 9 months more in regular or self-employment. After 3.5 years, participants still experience a 12 point advantage over comparable non-participants in the probability to be self- or regular employed. In addition, the program has large positive income effects. In total, treatment effects are robust to conventional sensitivity analyses and we find evidence for effect heterogeneity with respect to personality traits and risk preferences.

The propensity score matching approach relies on the conditional independence assumption which means that participation in the program is assumed to be unrelated to potential outcomes after matching on the observable characteristics. We have access to a combination of rich administrative and survey data which contain very detailed information on factors shown to influence the selection into the start-up subsidy, like education,

qualification, labor market history, as well as parental self-employment. In view of the fact that recent empirical findings stress the importance of personality traits and risk attitudes for entrepreneurial intentions and success, there remain concerns that participants and non-participants still differ systematically in unobserved characteristics even after conditioning on conventional control variables. It is argued that there might be positive selection into the program and treatment effects are therefore prone to overestimation.

To address these concerns, we additionally conduct a new kind of sensitivity analysis in this paper. Our survey data contain a set of variables capturing personality characteristics and risk tolerance. This allows us to model the selection process with and without these usually unobserved variables and compare the estimated treatment effects. We find evidence that openness and locus of control play an important role in the decision to join the program and start a business. Neglecting the personality variables leads, however, to only weak and mostly insignificant overestimations of the treatment effects. Our findings imply that in the usual case with no information on these personality characteristics, the remaining bias after controlling for traditional control variables like education and employment history is likely to be small.

A possible explanation for these only modest changes in the estimated effects is that pre-treatment outcomes were already affected by personality traits and risk preferences in the past. Although those are relevant in the decision to start a business, they are therefore already implicitly captured (at least in part) in employment histories. Controlling for detailed labor market histories in our conventional matching approach thus removes a major part of the selection bias. In this sense, our findings are in line with and confirm findings by Lechner and Wunsch (2013) who stress the importance of controlling for detailed employment histories for the validity of propensity score matching estimators in evaluating typical ALMP.

On a broader perspective, these personality characteristics are very likely to be most relevant for the selection into ALMP such as start-up subsidy programs which involve a high level of individual initiative, risky decisions and uncertainty. Given that the over-

estimation of the treatment effects turns out to be very small for the start-up subsidy analyzed in this paper, the importance of explicitly controlling for them in the evaluation of other programs like vocational training is most probably even less pronounced.

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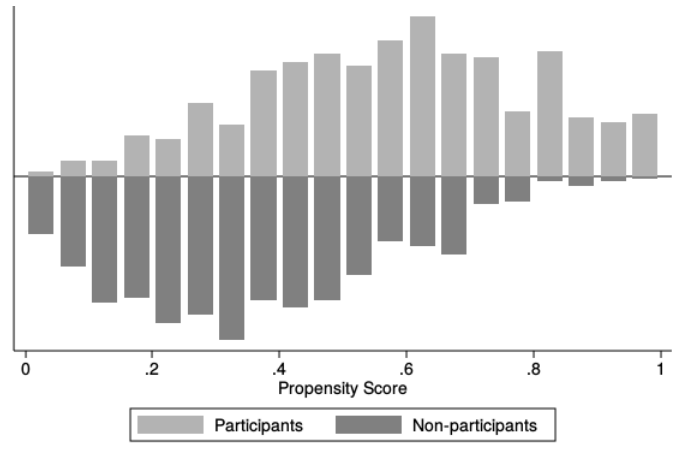
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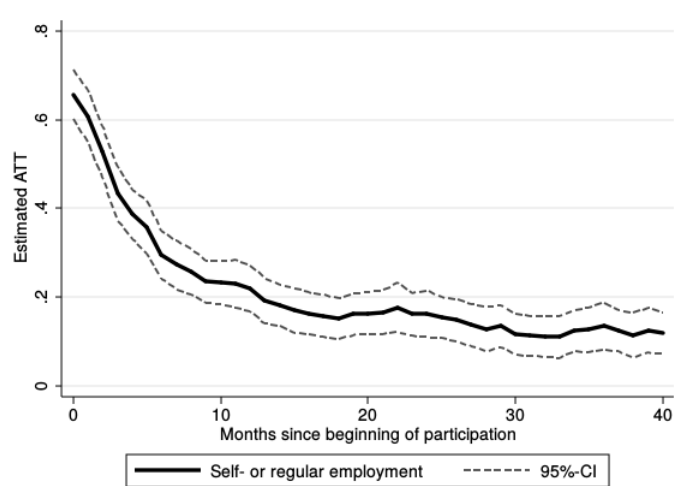
Figures and Tables

Figure 1: Propensity score distributions



Note: Depicted are propensity score distributions for participants and non-participants based on the propensity score probit specification including variables on socio-demographics, regional labor market, labor market history, and intergenerational information. The specification is presented in more detail in Table A.3.

Figure 2: Estimated average treatment effects on the treated over time



Note: Depicted are average treatment effects on the treated as the difference in mean outcomes between participants and matched non-participants over time using epanechnikov kernel propensity score matching with optimal bandwidth based on leave-one-out cross-validation. The 95% confidence interval is based on bootstrapped standard errors with 301 replications.

Table 1: Scope of selected ALMP in Germany (Social code book III)

Year	2006	2007	2008	2009	2010	2011
Entries (in thousand)						
Start-up subsidy	34	126	119	137	147	134
Vocational training	144	201	250	387	267	148
Training measures ¹	534	520	576	(227)	(0)	(0)
Total expenditures ² (in million Euros)						
Start-up subsidy	78	1,176	1,473	1,540	1,872	1,750
Vocational training	495	595	777	1,248	958	841
Training measures ¹	155	136	159	(98)	(0)	(0)

Source: Bundesagentur für Arbeit (2007-2012).

¹ Training measures were reformed on January 1, 2009.

² Total expenditures are deflated to base year 2010 using the consumer price index (Statistisches Bundesamt, 2014).

Table 2: Descriptive statistics for outcome variables

	Participants	Non-participants	p-value
A. Short term (21 months after start)			
Self-employed	0.83	0.11	0.00
Self- or regular employed	0.93	0.71	0.00
Unemployed	0.05	0.21	0.00
Disposable working income (Euros/month)	1927.35	1183.22	0.00
standard deviation	(1918.04)	(1446.34)	
median	[1500.00]	[1000.00]	
Household income (Euros/month)	3342.11	2707.60	0.00
standard deviation	(2624.64)	(2171.73)	
median	[3000.00]	[2350.00]	
B. Long term (40 months after start)			
Self-employed	0.74	0.12	0.00
Self- or regular employed	0.90	0.75	0.00
Unemployed	0.04	0.09	0.00
Disposable working income (Euros/month)	2357.17	1512.71	0.00
standard deviation	(2414.38)	(1816.92)	
median	[1800.00]	[1300.00]	
Household income (Euros/month)	3849.56	3114.22	0.00
standard deviation	(3026.95)	(3142.05)	
median	[3100.00]	[2500.00]	
Number of observations	589	699	

Note: Reported are sample averages (if not denoted otherwise) and p-values for t-tests of equal means. The number of observations can deviate for income measures due to very occasional item non-responses.

Table 3: Matching quality indicators

	Before matching	After matching
A. Number of variables with significant difference in means		
at 1%-level	11	0
at 5%-level	18	0
at 10%-level	24	1
B. Number of variables with a standardized bias		
< 1%	10	16
1% to < 3%	15	31
3% to < 5%	17	18
5% to < 10%	17	16
≥ 10%	23	1
mean standardized bias	7.9443	3.1348
median standardized bias	4.9549	2.6241
C. Pseudo-R ²	0.1796	0.0162
D. P-value of joint significance test	0.0000	1.0000
Total number of variables	82	82

Note: Reported are indicators for covariate balancing before and after epanechnikov kernel propensity score matching with optimal bandwidth for employment status “self- or regular employed” based on leave-one-out cross-validation. Equality of means is tested based on simple t-tests. The standardized bias is calculated as the difference of sample means for participants and non-participants as a percentage of the square root of the average of sample variances in both groups (Rosenbaum and Rubin, 1985). The pseudo-R² and the p-value of joint significance stem from a probit regression of the treatment indicator on all covariates (Sianesi, 2004).

Table 4: Treatment effect estimation

Outcome variable	21 months after start		40 months after start	
	ATT	p-value	ATT	p-value
Self- or regular employed	0.1659***	0.0000	0.1189***	0.0000
Cumulated effect ($\sum_{t=0}^{40}$, in months)			8.7331***	0.0000
Disposable working income (Euros/month)	636.64***	0.0000	525.71***	0.0000
Household income (Euros/month)	767.97***	0.0000	578.72***	0.0033

Note: Presented are estimated average treatment effects on the treated as the difference in mean outcomes between participants and matched non-participants using epanechnikov kernel propensity score matching with optimal bandwidth based on leave-one-out cross-validation. Following Huber et al. (2012) and MacKinnon (2006) p-values are bootstrapped and based on 301 replications. *** p<0.01/ ** p<0.05/ * p<0.10 significance level.

Table 5: Treatment effect estimation – Sensitivity I

Outcome variable	21 months after start		40 months after start	
	ATT	p-value	ATT	p-value
Self- or regular employed	0.1659***	0.0000	0.1189***	0.0000
grid-search bandwidth	0.1642***	0.0000	0.1176***	0.0000
trimmed sample	0.1741***	0.0000	0.1237***	0.0000
radius matching	0.1764***	0.0033	0.1391***	0.0000
Cumulated effect ($\sum_{t=0}^{40}$, in months)			8.7331***	0.0000
grid-search bandwidth			8.6430***	0.0000
trimmed sample			9.1585***	0.0000
radius matching			9.7680***	0.0000
conditional DID 1			8.6900***	0.0000
conditional DID 2			8.6973***	0.0000
Disposable working income (Euros/month)	636.64***	0.0000	767.97***	0.0000
grid-search bandwidth	626.48***	0.0000	753.90***	0.0000
trimmed sample	679.47***	0.0000	828.23***	0.0000
radius matching	602.60***	0.0000	681.81***	0.0066
Household income (Euros/month)	525.71***	0.0000	578.72***	0.0033
grid-search bandwidth	513.94***	0.0000	572.90***	0.0033
trimmed sample	573.74***	0.0000	607.12***	0.0066
radius matching	463.27***	0.0000	843.00***	0.0000

Note: Presented are estimated average treatment effects on the treated as the difference in mean outcomes between participants and matched non-participants using epanechnikov kernel propensity score matching with optimal bandwidth based on leave-one-out cross-validation (if not denoted otherwise). Following Huber et al. (2012) and MacKinnon (2006) p-values are bootstrapped and based on 301 replications. *** p<0.01/ ** p<0.05/ * p<0.10 significance level.

Grid-search bandwidth: The optimal bandwidth for epanechnikov kernel propensity score matching is based on a grid-search leave-one-out cross-validation following Galdo (2005).

Radius Matching: The treatment effects are estimated using radius matching with bias adjustment following Huber et al. (2012, 2013).

Trimmed Sample: The treatment effects are estimated based on an optimally trimmed sample following Huber et al. (2013).

Conditional DID: The treatment effects are estimated based on conditional difference-in-differences. The reference level is months in regular employment during the 10 years prior to entry into unemployment (conditional DID 1) and 6 months prior to entry into unemployment (conditional DID 2).

Table 6: Descriptive statistics for personality variables

	Participants	Non-participants	p-value
A. Big five			
conscientiousness	6.04	6.00	0.39
standard deviation	(0.81)	(0.86)	
extraversion	5.79	5.59	0.00
standard deviation	(1.07)	(1.11)	
agreeableness	6.08	6.09	0.99
standard deviation	(0.91)	(0.99)	
neuroticism	3.99	4.21	0.01
standard deviation	(1.39)	(1.34)	
openness	5.04	4.83	0.00
standard deviation	(1.35)	(1.32)	
B. Locus of control			
standard deviation	(0.81)	(0.87)	0.00
C. Readiness to take risks			
standard deviation	(1.97)	(2.00)	0.05
Number of observations	589	699	

Note: Reported are sample averages (if not denoted otherwise) and p-values for t-tests of equal means. All personality traits with the exception of readiness to take risk are measured on a scale from 1 to 7 where higher values indicate a stronger degree of the respective trait. Risk is measured on a scale from 0 to 10 where higher values indicate a higher willingness to take risk.

Table 7: Propensity score probit estimation

	Specification				
	Baseline	(2)	(3)	(4)	Extended
<i>Personality traits</i>					
Big five					
conscientiousness		-0.029			-0.077*
extraversion		0.057			0.019
agreeableness		-0.035			-0.030
neuroticism		-0.085**			-0.004
openness		0.145***			0.134***
Locus of control			0.229***		0.233***
Readiness to take risks				0.11***	0.064
Readiness to take risks squared				0.014	0.011
<i>Socio-demographics</i>					
yes	yes	yes	yes	yes	yes
<i>Regional labor market</i>					
yes	yes	yes	yes	yes	yes
<i>Labor market history</i>					
yes	yes	yes	yes	yes	yes
<i>Intergenerational information</i>					
yes	yes	yes	yes	yes	yes
Const.	yes	yes	yes	yes	yes
Number of observations	1288	1288	1288	1288	1288
log-Likelihood	-729.205	-719.145	-714.185	-725.700	-705.177
Pseudo-R ²	0.179	0.190	0.196	0.183	0.206
Hitrate	69.720	70.885	70.419	70.342	71.351

Note: Reported are probit coefficients. *** p<0.01/ ** p<0.05/ * p<0.10 significance level. All personality traits with the exception of readiness to take risk are initially measured on a scale from 1 to 7 where higher values indicate a stronger degree of the respective trait and then standardized. Risk is initially measured on a scale from 0 to 10 where higher values indicate a higher willingness to take risk and then standardized. Full estimation results are presented in Table A.3.

Table 8: Treatment effect estimation – Sensitivity II

Outcome variable	Specification		Difference	
	Baseline	Extended	Baseline vs extended	p-value
A. Short term (21 months after start)				
Self- or regular employed	0.1659***	0.1635***	-0.0024	0.8436
grid-search bandwidth	0.1642***	0.1637***	-0.0005	0.9691
age restriction 30-60	0.1549***	0.1505***	-0.0044	0.7448
Disposable working income (Euros/month)	636.64***	584.23***	-52.41	0.1427
grid-search bandwidth	626.48***	574.71***	-51.77	0.1692
age restriction 30-60	595.96***	545.90***	-50.06	0.3155
Household income (Euros/month)	525.71***	435.29***	-90.42*	0.0791
grid-search bandwidth	513.94***	424.60***	-89.34*	0.0923
age restriction 30-60	481.56***	411.89**	-69.67	0.3067
B. Long term (40 months after start)				
Self- or regular employed	0.1189***	0.1071***	-0.0118	0.3168
grid-search bandwidth	0.1176***	0.1082***	-0.0094	0.4621
age restriction 30-60	0.1076***	0.1010***	-0.0066	0.6107
Cumulated effect ($\sum_{t=0}^{40}$, in months)	8.7331***	8.4291***	-0.3039	0.4494
grid-search bandwidth	8.6430***	8.4087***	-0.2343	0.5953
age restriction 30-60	8.2045***	7.9809***	-0.2236	0.6185
Disposable working income (Euros/month)	767.97***	683.63***	-84.34*	0.0738
grid-search bandwidth	753.90***	669.74***	-84.16*	0.0951
age restriction 30-60	700.98***	632.00***	-68.98	0.2757
Household income (Euros/month)	578.72***	490.05**	-88.67	0.2834
grid-search bandwidth	572.90***	485.25**	-87.65	0.3178
age restriction 30-60	499.88**	462.39**	-37.49	0.7029

Note: Presented are estimated average treatment effects on the treated as the difference in mean outcomes between participants and matched non-participants for the baseline (cf. Table 4) and extended specification using epanechnikov kernel propensity score matching with optimal bandwidth based on leave-one-out cross-validation (if not denoted otherwise). Following Huber et al. (2012) and MacKinnon (2006) p-values are bootstrapped and based on 301 replications. The baseline specification contains variables on socio-demographics, regional labor market, labor market history, and intergenerational information while the extended specification additionally includes personality variables. The specifications are presented in more detail in Table A.3. The standard errors for the differences in treatment effects are based on bootstrapping with 301 replications. *** p<0.01/ ** p<0.05/ * p<0.10 significance level.

Grid-search bandwidth: The optimal bandwidth for epanechnikov kernel propensity score matching is based on a grid-search leave-one-out cross-validation following Galdo (2005).

Age restriction 30-60 restricts the sample to individuals aged between 30 and 60 years old.

Table 9: Treatment effect estimation – Effect heterogeneity

Outcome variable: Self- or regular employed 40 months after start			
Personality trait	low	medium	high
A. Big five			
conscientiousness			
baseline	0.1588***	0.0554	0.1673***
extended	0.1479***	0.0335	0.1392**
extraversion			
baseline	0.0791	0.0671*	0.1484***
extended	0.0855	0.0470	0.1087**
neuroticism			
baseline	0.1347***	0.1343***	0.1298***
extended	0.1455***	0.1116***	0.1083**
openness			
baseline	0.1283*	0.1138***	0.1111**
extended	0.0537	0.1060**	0.0930
B. Locus of control			
baseline	0.1203***	0.1359***	0.0990**
extended	0.1016***	0.1274***	0.0915
C. Readiness to take risks			
baseline	0.0900**	0.0777**	0.1455***
extended	0.0601	0.0867**	0.1097*

Note: The sample is split into three groups based on the terciles of each trait in the participants' group. Presented are estimated average treatment effects on the treated as the difference in mean outcomes between participants and matched non-participants in each group for the baseline and extended specification using epanechnikov kernel propensity score matching with optimal bandwidth based on leave-one-out cross-validation. Following Huber et al. (2012) and MacKinnon (2006) p-values are bootstrapped and based on 301 replications. The baseline specification contains variables on socio-demographics, regional labor market, labor market history, and intergenerational information while the extended specification additionally includes all other personality variables. The specifications are presented in more detail in Table A.3. *** p<0.01/ ** p<0.05/ * p<0.10 significance level.

Appendix

Table A.1: Personality variable items

Big five: *To what degree do the following statements apply to you personally?*
Please answer on the basis of a scale ranging from 1 “does not apply at all” to 7 “applies perfectly”.

I see myself as someone who . . .

- Q1. does a thorough job.
- Q2. is communicative, talkative.
- Q3. worries a lot.
- Q4. tends to be lazy.
- Q5. is outgoing, sociable.
- Q6. values artistic experiences.
- Q7. gets nervous easily.
- Q8. does things effectively and efficiently.
- Q9. is considerate and kind to others.
- Q10. has an active imagination.

Aggregated big five indices scaled from 1 to 7:

- Conscientiousness = $[Q1+R(Q4)+Q8]/3$
- Extraversion = $[Q2+Q5]/2$
- Agreeableness = $[Q9]$
- Neuroticism = $[Q3+Q7]/2$
- Openness = $[Q6+Q10]/2$

Locus of control: *To what degree do you personally agree with the following statements?*
Please answer on the basis of a scale ranging from 1 “do not agree at all” to 7 “agree completely”.

- Q1. How my life takes course is entirely dependent on me.
- Q2. What one achieves is, in the first instance, a question of destiny and luck.
- Q3. I often experience that others make decisions about my life.
- Q4. Success is gained through hard work.
- Q5. When I encounter difficulties in life, I often doubt my abilities.
- Q6. I have little control over things which happen in my life.

Aggregated locus of control index scaled from 1 to 7:

- Locus of control = $[Q1+R(Q2)+R(Q3)+Q4+R(Q5)+R(Q6)]/6$

Risk preferences: *To what degree are you ready to take risks in general?*
Please answer on the basis of a scale ranging from 0 “not at all ready” to 10 “perfectly ready”.

- Readiness to take risk

Table A.2: Descriptive statistics for control variables

	Participants	Non-participants	p value
<i>Socio-demographics</i>			
Age			
average age (years)	40.97	40.80	0.75
younger than 25 years	0.03	0.05	0.05
25 to less than 35 years	0.25	0.24	0.48
35 to less than 45 years	0.36	0.35	0.65
45 to less than 56 years	0.29	0.29	0.75
56 years and older	0.07	0.07	1.00
Male			
East Germany	0.22	0.25	0.22
German citizen	0.96	0.96	0.95
Health restrictions	0.03	0.04	0.34
Married	0.60	0.55	0.07
Number of children			
no children	0.61	0.64	0.21
one child	0.18	0.17	0.75
two children and above	0.21	0.18	0.22
Children under 10 present	0.24	0.21	0.30
Single parent	0.06	0.05	0.53
Highest schooling certificate			
lower secondary school	0.16	0.13	0.23
middle secondary school	0.31	0.29	0.55
upper secondary school	0.53	0.56	0.25
other/no degree	0.00	0.01	0.16
Professional education			
vocational training	0.43	0.42	0.83
professional/vocational academy	0.16	0.10	0.00
technical college/university degree	0.36	0.42	0.02
other/no training	0.06	0.05	0.81
Professional qualification			
unskilled workers	0.65	0.56	0.00
skilled workers	0.23	0.25	0.49
skilled workers with technical college education	0.03	0.03	0.62
top management	0.09	0.16	0.00
<i>Regional labor market</i>			
Regional cluster			
type Ia	0.15	0.14	0.68
type Ib	0.09	0.09	0.91
type IIa	0.06	0.06	0.99
type IIb	0.09	0.11	0.17
type IIc	0.06	0.06	0.78
type IIIa	0.15	0.16	0.75
type IIIb	0.05	0.05	0.91
type IVa	0.08	0.07	0.53
type IVb	0.06	0.08	0.38
type IVc	0.04	0.02	0.13
type Va	0.04	0.04	0.75
type Vb	0.08	0.07	0.44
type Vc	0.05	0.04	0.59

(Table continued on next page)

(Table continued)

	Participants	Non-participants	p value
<i>Labor market history</i>			
Lifetime unemployment (years, standardized by age-16)	0.04	0.08	0.00
Second to last year before entering unemployment			
months employed	9.29	8.67	0.01
months in labor market program	0.29	0.51	0.01
Next to last year before entering unemployment			
months employed	9.72	9.62	0.62
months in labor market program	0.18	0.30	0.06
Last year before entering unemployment			
months employed	9.37	9.39	0.92
months in labor market program	0.52	0.46	0.45
Employment status before entering unemployment			
dependent employment	0.59	0.49	0.00
self-employment	0.14	0.03	0.00
school/apprenticeship	0.02	0.03	0.17
disable to work/unemployable	0.04	0.10	0.00
others	0.22	0.35	0.00
Occupational group before entering unemployment			
manufacturing	0.15	0.15	0.90
technical profession	0.06	0.06	0.97
services	0.77	0.75	0.58
others	0.03	0.04	0.28
Daily income from last employment (Euro)	75.76	75.98	0.94
Duration of last unemployment spell			
average number (months)	4.61	4.93	0.29
less than 1 month	0.15	0.05	0.00
1 to less than 3 months	0.29	0.34	0.05
3 to less than 6 months	0.23	0.26	0.21
6 to less than 12 months	0.25	0.28	0.31
12 to less than 24 months	0.06	0.05	0.52
24 months and above	0.01	0.01	0.70
Monthly unemployment benefit			
average amount (Euro)	983.55	973.60	0.75
less than 300 Euros	0.11	0.08	0.03
300 to less than 600 Euros	0.13	0.16	0.21
600 to less than 900 Euros	0.22	0.27	0.07
900 to less than 1200 Euros	0.20	0.20	0.89
1200 to less than 1500 Euros	0.14	0.12	0.15
1500 Euros and above	0.19	0.18	0.66
Remaining unemployment benefit entitlement			
average number (months)	7.35	7.00	0.19
less than 3 months	0.19	0.24	0.05
3 to less than 6 months	0.20	0.16	0.09
6 to less than 9 months	0.12	0.17	0.01
9 to less than 12 months	0.21	0.22	0.48
12 months and above	0.29	0.21	0.00
Number of placement offers	1.65	2.04	0.16
<i>Intergenerational information</i>			
One or both parents born abroad	0.16	0.18	0.38
Father and/or mother is/was self-employed	0.32	0.30	0.43
Father employed when respondent 15 years old	0.90	0.89	0.59
Highest schooling certificate of father			
lower secondary school	0.41	0.40	0.69
middle secondary school	0.16	0.21	0.02
upper secondary school	0.28	0.23	0.03
other/no degree	0.14	0.15	0.52
Number of observations	589	699	

Note: Reported are sample averages and p-values for t-tests of equal means.

Table A.3: Propensity score probit estimation

	Baseline	(2)	Specification (3)	(4)	Extended
<i>Personality traits</i>					
Big five					
conscientiousness		-0.029			-0.077*
extraversion		0.057			0.019
agreeableness		-0.035			-0.030
neuroticism		-0.085**			-0.004
openness		0.145***			0.134***
Locus of control			0.229***		0.233***
Readiness to take risks				0.11***	0.064
Readiness to take risks squared				0.014	0.011
<i>Socio-demographics</i>					
Age					
(ref.: younger than 25 years)					
25 to less than 35 years	0.272	0.22	0.287	0.258	0.241
35 to less than 45 years	0.084	0.015	0.14	0.071	0.061
45 to less than 56 years	0.049	-0.033	0.129	0.035	0.042
56 years and older	0.15	0.048	0.32	0.155	0.237
Male	-0.006	0.004	-0.036	-0.036	-0.037
East Germany	-0.558***	-0.542***	-0.553***	-0.569***	-0.555***
German citizen	-0.145	-0.179	-0.168	-0.176	-0.216
Health restrictions	-0.074	-0.070	-0.004	-0.063	0.008
Married	0.01	0.033	0.012	0.028	0.03
Number of children					
(ref.: no children)					
one child	0.227	0.27*	0.223	0.234	0.272*
two children and above	0.317**	0.327**	0.297**	0.32**	0.323**
Children under 10 present	-0.172	-0.186	-0.133	-0.162	-0.142
Single parent	0.214	0.274	0.236	0.209	0.288
Highest schooling certificate					
(ref.: other/no certificate)					
lower secondary school	1.424**	1.537**	1.533**	1.374**	1.603**
middle secondary school	1.214**	1.314**	1.283**	1.196**	1.356**
upper secondary school	1.076*	1.151*	1.171*	1.068*	1.221*
Professional education					
(ref.: other/no training)					
vocational training	-0.344*	-0.400**	-0.360*	-0.319*	-0.390**
professional/vocational academy	-0.132	-0.191	-0.145	-0.128	-0.184
technical college/university degree	-0.443**	-0.498**	-0.466**	-0.417**	-0.503**
Professional qualification					
(ref.: unskilled workers)					
skilled workers	0.142	0.156	0.122	0.129	0.118
skilled workers with technical college education	-0.017	-0.017	-0.025	-0.035	-0.034
top management	-0.202	-0.219	-0.232*	-0.218	-0.243*
<i>Regional labor market</i>					
Regional cluster					
(ref.: type Ia)					
type Ib	-0.151	-0.124	-0.149	-0.152	-0.138
type IIa	0.055	0.052	0.01	0.05	0.01
type IIb	0.278	0.302	0.333*	0.286	0.357*
type IIc	0.146	0.167	0.15	0.145	0.163
type IIIa	-0.039	-0.024	-0.024	-0.040	-0.006
type IIIb	0.049	0.083	0.133	0.06	0.165
type IVa	-0.059	-0.053	-0.030	-0.074	-0.018
type IVb	-0.062	-0.042	-0.089	-0.070	-0.067
type IVc	0.291	0.325	0.283	0.318	0.328
type Va	0.532*	0.575**	0.545*	0.52*	0.585**
type Vb	0.616**	0.615**	0.611**	0.606**	0.631**
type Vc	0.718**	0.74**	0.696**	0.735**	0.754***
<i>Labor market history</i>					
Lifetime unemployment (years, standardized by age-16)	-10.083***	-10.366***	-9.710***	-10.065***	-10.121***
Lifetime unemployment (squared)	12.504***	13.041***	12.302***	12.589***	12.852***
Second to last year before entering unemployment					
months employed	0.012	0.011	0.015	0.012	0.015
months in labor market program	-0.004	-0.002	-0.013	-0.005	-0.009

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	Baseline	(2)	Specification		Extended
			(3)	(4)	
Next to last year before entering unemployment					
months employed	-0.014	-0.009	-0.017	-0.012	-0.013
months in labor market program	-0.069	-0.052	-0.064	-0.063	-0.053
Last year before entering unemployment					
months employed	-0.017	-0.019	-0.017	-0.017	-0.017
months in labor market program	0.054*	0.055*	0.056*	0.055*	0.059*
Employment status before entering unemployment (ref.: other status)					
dependent employment	0.376***	0.369***	0.367***	0.376***	0.362***
self-employment	1.501***	1.454***	1.512***	1.510***	1.483***
school/apprenticeship	-0.033	-0.055	-0.117	-0.035	-0.111
disable to work/unemployable	-0.213	-0.204	-0.223	-0.233	-0.251
Occupational group before entering unemployment (ref.: other group)					
manufacturing	0.175	0.143	0.161	0.199	0.134
technical profession	0.205	0.222	0.221	0.229	0.237
services	0.243	0.223	0.221	0.243	0.212
Daily income from last employment (Euro)	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
Duration of last unemployment spell (ref.: less than 1 month)					
1 to less than 3 months	-0.724***	-0.712***	-0.745***	-0.751***	-0.754***
3 to less than 6 months	-0.543***	-0.533***	-0.596***	-0.574***	-0.603***
6 to less than 12 months	-0.577***	-0.570***	-0.610***	-0.613***	-0.623***
12 to less than 24 months	-0.454*	-0.413*	-0.477*	-0.445*	-0.443*
24 months and above	-0.567	-0.632	-0.564	-0.606	-0.600
Monthly unemployment benefit (ref.: less than 300 Euros)					
300 to less than 600 Euros	-0.145	-0.114	-0.064	-0.139	-0.054
600 to less than 900 Euros	-0.186	-0.174	-0.147	-0.176	-0.132
900 to less than 1200 Euros	-0.040	-0.033	-0.008	-0.039	0.004
1200 to less than 1500 Euros	-0.044	-0.001	-0.037	-0.035	0.014
1500 Euros and above	-0.001	0.015	-0.017	-0.013	0.01
Remaining unemployment benefit entitlement (ref.: less than 3 months)					
3 to less than 6 months	0.327**	0.317**	0.33**	0.338**	0.334**
6 to less than 9 months	-0.139	-0.142	-0.132	-0.131	-0.133
9 to less than 12 months	-0.012	-0.015	-0.016	-0.002	-0.013
12 months and above	-0.025	-0.012	-0.042	-0.014	-0.025
Number of placement offers	0.006	0.006	0.008	0.006	0.007
<i>Intergenerational information</i>					
One or both parents born abroad	-0.091	-0.098	-0.075	-0.109	-0.104
Father and/or mother is/was self-employed	0.17**	0.181**	0.172**	0.166*	0.171*
Father employed when respondent 15 years old	0.066	0.063	0.05	0.067	0.051
Highest schooling certificate of father (ref.: other/no certificate)					
lower secondary school	0.026	0.035	0.008	0.012	0.015
middle secondary school	-0.032	-0.032	-0.042	-0.042	-0.036
upper secondary school	0.254*	0.247*	0.25*	0.246*	0.236
Const.	-0.186	-0.193	-0.259	-0.146	-0.237
Number of observations	1288	1288	1288	1288	1288
log-Likelihood	-729.205	-719.145	-714.185	-725.700	-705.177
Pseudo-R ²	0.179	0.190	0.196	0.183	0.206
Hitrate	69.720	70.885	70.419	70.342	71.351

Note: Reported are probit coefficients. *** p<0.01/ ** p<0.05/ * p<0.10 significance level. All personality traits with the exception of readiness to take risk are initially measured on a scale from 1 to 7 where higher values indicate a stronger degree of the respective trait and then standardized. Risk is initially measured on a scale from 0 to 10 where higher values indicate a higher willingness to take risk and then standardized.