

Bömmel, Nadja et al.

Article — Published Version

From welfare to work: The health and material well-being effects of long-term employment subsidies in Germany

International Journal of Social Welfare

Provided in Cooperation with:

John Wiley & Sons

Suggested Citation: Bömmel, Nadja et al. (2024) : From welfare to work: The health and material well-being effects of long-term employment subsidies in Germany, International Journal of Social Welfare, ISSN 1468-2397, Wiley Periodicals, Inc., Hoboken, NJ, Vol. 34, Iss. 1, <https://doi.org/10.1111/ijsw.12653>

This Version is available at:

<https://hdl.handle.net/10419/313703>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.


If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<http://creativecommons.org/licenses/by-nc-nd/4.0/>

ORIGINAL ARTICLE

From welfare to work: The health and material well-being effects of long-term employment subsidies in Germany

Nadja Bömmel¹ | Mustafa Coban¹ | Zein Kasrin² | Maximilian Schiele²  |
Claudia Wenzig¹ | Joachim Wolff² | Cordula Zabel²

¹Department Panel Study Labour Market and Social Security (PASS), Institute for Employment Research (IAB), Nuremberg, Germany

²Department Basic Income Support and Activation (GSA), Institute for Employment Research (IAB), Nuremberg, Germany

Correspondence

Maximilian Schiele, Department Basic Income Support and Activation (GSA), Institute for Employment Research (IAB), Regensburger Str. 104, 90478 Nuremberg, Germany.
Email: maximilian.schiele@iab.de

Abstract

This paper analyses effects of subsidised, predominantly non-standard, employment within the German labour market programme ‘participation in the labour market’ for long-term welfare recipients on their health satisfaction, health-based quality of life, satisfaction with standard of living and households’ actual ownership of important goods (e.g., car or new clothes) or the lack thereof due to financial reasons. We differentiated subgroups by health, age and working hours. Data for participants and non-participants (but entitled to welfare benefits) stem from the first two waves (2020/2021) of the panel survey ‘Quality of Life and Social Participation’. To identify causal effects, we employed matching methods based on administrative and survey data. Our findings show that 1 and 2 years after programme start, participation had significant positive effects on all indicators of health and standard of living. Thus, for the programme’s focus group, subsidised employment, even if non-standard, can contribute to improving health and material well-being.

KEYWORDS

active labour market policy (ALMP), health, long-term unemployment, matching analysis, material resources, non-standard work, social participation, welfare benefits

INTRODUCTION

In January 2019, a new employment subsidy programme, ‘Teilhabe am Arbeitsmarkt’ (engl. ‘participation in the labour market’, hereafter TA), was introduced in

Germany. The goal of the programme was not only to improve employment opportunities but also the social participation of people who have been unemployed and receiving welfare benefits for many years. The programme aims to bring long-term welfare recipients back

Abbreviations: ALMP, active labour market policy; ATT, average treatment effect on the treated; BMAS, Bundesministerium für Arbeit und Soziales (engl. Federal Ministry of Labour and Social Affairs); ESF, European Social Fund; IAB, Institut für Arbeitsmarkt- und Berufsforschung; IAQ, Institut Arbeit und Qualifikation; IAW, Institut für Angewandte Wirtschaftsforschung; ISG, Institut für Sozialforschung und Gesellschaftspolitik; MSB, mean standardised absolute bias; PCA, principal component analysis; RWI, Leibniz-Institut für Wirtschaftsforschung; SOKO, Sozialforschung und Kommunikation; TA, Teilhabe am Arbeitsmarkt (engl. participation in the labour market); ZEW, Leibniz-Zentrum für Europäische Wirtschaftsforschung Zoom.

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2024 The Authors. *International Journal of Social Welfare* published by Akademikerförbundet SSR (ASSR) and John Wiley & Sons Ltd.

to work with the help of very generous wage subsidies that can be granted to an employer for up to 5 years.

To achieve a successful transition from welfare to work for this hard-to-place group, non-standard employment contracts play a central role, especially part-time employment and fixed-term contracts. On the one hand, working hours must account for the needs and abilities of the programme participants, reflected in a part-time employment rate of 54.9% in our sample (see Table 4). On the other hand, employers tend to be apprehensive about hiring this group of long-term welfare recipients. These concerns can be mitigated by using fixed-term contracts, an option 80% of the employers chose (see Table 4). Thus, the overwhelming majority of programme participants were in one or both forms of non-standard employment.

This article analyses the changes that occur when long-term unemployed individuals transition from welfare to subsidised employment. Specifically, we focused on effects on the participants' health and material resources. Meta-analyses on wage or hiring subsidies documented generally positive labour market integration effects (e.g., Kluve, 2010; Martin & Grubb, 2001). In turn, earnings were also positively affected—even in time-limited job creation schemes, at least during participation (Hohmeyer & Wolff, 2010). Focusing on material well-being and the actual goods in the household allowed us to directly observe the ways in which subsidised employment improved the material conditions rather than a pure increase in income. Investments in household goods may also require savings and income security over longer periods of time. Thus, positive income effects might not immediately translate into material well-being.

Being employed is positively associated with health and material resources. However, due to the non-standard nature of most subsidised work contracts, it is questionable whether a positive association will become evident in this case, too. Fixed-term contracts have been shown to come with a sense of insecurity and stress, which may negatively affect health. In addition, wages for part-time employment are lower, with negative implications for material well-being. Therefore, our study aims to answer the following questions: Can these subsidised jobs, despite their usually non-standard nature, improve health and material well-being in the short- to medium-run? To what extent can the most disadvantaged programme participants such as those characterised by poor health or older age benefit from subsidised employment?

To answer these questions, we used data from the panel survey 'Quality of Life and Social Participation', which was designed by the German Institute for Employment Research, for the purpose of evaluating this programme. The survey targeted participants starting their

Key Practitioner Message

- Subsidised employment, even when non-standard, is a viable policy for improving health and material participation of long-term welfare recipients.
- Welfare recipients aged at least 50 years are more positively affected by participation than younger welfare recipients.
- Full-time employed participants benefit more from subsidised employment in terms of material participation, but also health.

subsidised employment in 2019, as well as a control group of non-participants. The survey data analysed covers the years 2020 and 2021. Therefore, our analysis examined participants' health and material well-being outcomes approximately 1 and 2 years after programme start. To estimate the effects of participation on these outcomes, we employed matching methods using variables from both administrative and survey data to refine the matching quality.

The results show that long-term employment subsidies, which in the German case heavily rely on non-standard employment, have the potential to increase health as well as material resources. More disadvantaged groups such as those with pre-existing health impairments or older welfare recipients benefit at least as much as or even more than others from the programme, despite their employment impediments.

PROGRAMME DESCRIPTION AND BACKGROUND

The TA programme is a wage subsidy which came into force in 2019, targeting hard to place unemployed (means-tested) welfare recipients. The subsidy is provided for all forms of employment subject to social insurance contributions that meet minimum or union wage standards in any sector (private company, public service or non-profit employer). The subsidy can be granted for up to 5 years and is very generous. In the first 2 years, employers receive a 100% subsidy covering the entire wage of the subsidised employee. Thereafter, the subsidised portion of the wage drops by 10 percentage points for each additional year, reaching 70% by the fifth and last year.

To be eligible for subsidised employment under TA, potential candidates must be at least 25 years old and must have collected welfare benefits for at least six of the

last 7 years. During this period, welfare recipients must have been jobless most of the time. The intention is to target participants with almost no prospects of finding a job on their own. The group of persons satisfying these conditions made up a significant share of 39% of all employable welfare benefit recipients in 2019 (Lang et al., 2022). However, job centres have discretion over who is enrolled in the programme. Based on data from the Department of Statistics of the German Federal Employment Agency, the inflow of welfare recipients into TA in 2019 was more than 39,000 people, which is small compared to the number of eligible people, which we estimated on the basis of Bauer et al. (2021) and Lang et al. (2022) to be around 1.5 million. The relatively low share of participants can be explained by the high cost of the programme and the limited funding available to the job centres.

Using statistical matching methods, Tübbicke and Kasrin (2023) show that 4.8% of TA participants would have found an unsubsidised socially insured job without participation within 14 months (as measured by their matched control group), compared to only 3.7% for an average person that is eligible for the TA programme. That means that the TA participants represent a positive selection of the eligible welfare recipients. While this comparison is based on observable characteristics such as employment history, the selection could also be influenced by unobservable characteristics such as motivation or intelligence. This potential selection on unobserved variables could make the results of the effect estimation based on the matching procedure less reliable. However, as shown by Tübbicke (2023), this problem of unobserved confounders can be corrected if a large set of administrative background variables is used, as is the case in the present study.

EMPLOYMENT STATUS, MATERIAL RESOURCES AND HEALTH: LITERATURE REVIEW AND HYPOTHESES

General theoretical considerations

Unemployment has been shown to have detrimental effects on the well-being of the affected (Clark & Oswald, 1994; Winkelmann & Winkelmann, 1998). Two factors which might cause part of this decline in well-being are the negative effects of unemployment on health and material resources. A number of studies in the literature examined the complex interaction between health status and material resources on the one hand, and employment status on the other hand, and underline the

negative impacts of unemployment, see for example the review by Brand (2015) and the meta-analysis by Paul and Moser (2009) as well as Gallie et al. (2003) and Whelan et al. (2001). Three theories are most commonly used to explain this negative effect of unemployment on well-being in general and can also be used to explain the impact on health and material resources: the Latent Deprivation Model by Jahoda (1982), the Agency Restriction Model by Fryer (1986) and the theory on unemployment and loss of social status postulated by Ezzy (1993). While all three theories predict the same negative effect of unemployment, they differ particularly in terms of the mechanism underlying this effect.

Jahoda (1982) stated that work serves a manifest or material function which is to earn a living, but highlighted that unemployment also leads to a loss of the fundamental latent functions of work, especially time structure, social contacts, participation in collective goals, status or identity and regular activity, which has a negative impact on well-being and health. In the Agency Restriction Model, Fryer also acknowledged the latent benefits of work but emphasised the higher importance of financial aspects (Fryer, 1986, 1997; Fryer & Payne, 1986). According to Fryer, the loss of income as a result of unemployment leads to losing control over one's life course and facing an insecure future, which leads to a deterioration in (material) well-being and health. Thus for Fryer, the lack of disposable income and the related material deficits is the most important mechanism. Ezzy (1993) highlights the role of status and social recognition on individuals' health: Unemployment is associated with loss of status and social recognition, which in turn has a negative impact on health.

Empirical evidence suggests that all three mechanisms (i.e., loss of latent functions of work, loss of income and loss of status) can explain some of the negative effects of unemployment on health and material well-being. With reference to the theoretical arguments by Jahoda and Fryer, Gundert and Pohlen (2022) showed empirically that losing a job led to reduced material resources in the household, to lower mental health and to a decline in the standard of living in the short-run for Germany. Several studies for Germany (Christoph & Lietzmann, 2013; Pohlen, 2019) as well as for Europe (Berthoud et al., 2004; Whelan et al., 2003) revealed that the level of deprivation, for example in terms of food, clothing, financial possibilities (like saving money regularly) as well as cultural and social participation, rises with unemployment duration. Regarding health, Krug and Eberl (2018) found that, in Germany, current unemployment as well as an increasing unemployment duration was associated with a significant loss in health satisfaction.

The same mechanisms that explain the decline in health and material resources due to the loss of employment can also account for their improvements with the transition from unemployment into employment, which has been observed in many empirical studies. Taking up employment is positively associated with physical and mental health (e.g., Carlier et al., 2013; Hoare & Machin, 2010; Modini et al., 2016).

In terms of counteracting material deprivation, being employed reduces the risk of being poor. In Germany, 15.9% of the population had a net equivalent income lower than 60% of the German median income in 2019. Among the employed, this rate is only 8% while it is 57.9% among the unemployed (BMAS, 2021). The empirical literature also showed that participating in the German labour market leads to a higher net income, a lower level of material deprivation, and a lower poverty risk compared to being unemployed (Beste et al., 2014; Blömer & Peichl, 2020; Dingeldey et al., 2012).

The special circumstances of non-standard and subsidised work

Transferring the general positive effect of employment on health and material well-being to the special circumstances of subsidised work may not be completely straightforward, since the majority of subsidised jobs is non-standard. For non-standard employment, which generally comprises jobs characterised by low wages, a lack of social security, instability as well as insecurity, different mechanisms might play a role.

Considering health, studies have shown that multiple characteristics of non-standard employment were associated with stress- and health-related risks (Böhnke et al., 2016; Chandola & Zhang, 2018; Hünefeld, 2018; Tophoven & Tisch, 2016). According to Siegrist (1996) gratification crises, that is, low rewards in terms of income, recognition and career opportunities, combined with a high workload leads to negative effects on health. It can be assumed that these crises are more likely for non-standard jobs. Some studies also found negative effects of fixed-term compared to permanent employment on health (e.g., Minelli et al., 2014), while others found no effects (LaMontagne et al., 2014), or effects only for certain subgroups, such as by education level (Hammarström et al., 2011) or by gender (Peckham et al., 2022).

With respect to material resources, being employed does not automatically imply that individuals or households are able to earn enough to make a living or to reach a satisfactory standard of living. Over the last years, in-work poverty has increased in many European countries, which can be traced to increases in non-standard

employment (in particular temporary contracts and part-time work) (Peña-Casas et al., 2019). Compared to employees working full-time, those working part-time faced a two to three times higher risk of being poor (BMAS, 2021).

Whether active labour market programmes can substitute regular employment concerning their effects on material well-being and health and whether the same mechanisms come into play has been investigated in the literature, albeit little is known about wage subsidies. In their review on ALMPs in different countries, Puig-Barrachina et al. (2020) concluded that more than 80% of the included studies revealed positive effects on health. This is in line with Coutts et al. (2014) stating that ALMPs can counteract the health risks of unemployment and of Korpi (1997) who found that participation in Swedish manpower programmes reduced psychological distress. Strandh (2001) showed that different workplace participation programmes in Sweden improved general health. Using social enterprises in Belgium as examples for activating labour market policies, Nicaise (2007) found that, in one of three programmes, participants were more likely to have made ends meet and to save some money.

Studies also investigated wage subsidy programmes in Germany. Analysing TA, results showed that 1 year after programme start, participation significantly raised social participation and satisfaction levels with health, standard of living and quality of life, with higher effects found for males (Kasrin et al., 2023). Here, we additionally present findings 2 years after programme start and for more in-depth indicators of health and material resources.

Three related federal predecessor wage subsidy programmes in Germany were ‘Soziale Teilhabe am Arbeitsmarkt’ (‘social participation in the labour market’), the programme ‘Eingliederung von Langzeitarbeitslosen in den Arbeitsmarkt’ (‘labour market integration for the long-term unemployed’) financed by the European Social Fund (ESF) and the ‘Beschäftigungszuschuss’ (‘employment grant’). All three programmes are no longer available to welfare recipients. ‘Soziale Teilhabe am Arbeitsmarkt’ had positive effects on consumption and participation in social events (IAQ, ZEW, Zoom, & SOKO, 2019, pp. 97–98). Also, the ‘Beschäftigungszuschuss’ positively affected participants’ ability to save money and decreased their likelihood of foregoing important expenditures like dental treatments (ISG, IAB, & RWI, 2011, p. 218). Ivanov et al. (2020) found positive effects of ‘Soziale Teilhabe am Arbeitsmarkt’ on mental health and life satisfaction, with higher effects for participants with health impairments or long-term welfare dependence compared with other participants. IAQ, ZEW, Zoom and SOKO (2019) found similar effects on general health; however, these effects disappeared over

time. It has been shown descriptively that health satisfaction was higher for participants in the ESF programme compared to the unemployed control group, but lower than among other workers (ISG, IAW, & SOKO, 2021, p. 208).

These experiences from the predecessor programmes influenced the TA programme design. Our analyses can contribute to understanding whether the TA programme, which provides comparatively secure, though largely fixed-term employment for long-term welfare benefit recipients, is beneficial for health and material well-being outcomes.

Hypotheses on the potential effects on material resources and health for TA participants

Against the background of the theories and previous findings, we formulated four hypotheses to be tested empirically.

Concerning health, we expected that the transition of the long-term unemployed into employment offered within the TA programme provides the opportunity to benefit from Jahoda's (1982) latent functions (such as meaningfulness through work, maintaining social contacts and providing a daily structure) as well as manifest functions of employment leading to an improvement in participants' health.

H1a. Participating in the TA programme leads to an improvement in the mental and physical health of the participants compared to the control group.

Referring to the non-standard nature of many subsidised jobs and following Fryer (1986), part-time work or fixed-term contracts may limit the agency of the participants due to lower income that restricts long-term planning. This lack of security and possibly also the stigma of working in a subsidised job may also hurt the sense of social status and recognition as highlighted by Ezzy (1993). Additionally, it can result in stress that negatively impacts health. Following Siegrist's (1996) gratification crisis approach, negative health effects may result from low recognition, income and career opportunities in combination with a high work load and a disequilibrium in work-life balance.

H1b. Participation in the TA programme may also negatively impact health.

Concerning the material resources, it is important to note that jobs eligible for the TA programme are paid

either following the rules of the minimum wage or the corresponding union wage and hence leads to a substantial boost in disposable income. Thus, TA participants can afford more leisure activities, low- or medium-priced consumables and may save money for unpredictable expenses in the future leading to a higher satisfaction with the individual's standard of living.

H2. Participating in the TA programme leads to a higher satisfaction with the standard of living and to higher material resources.

With respect to our heterogeneity analysis, we study the effects of participation for men and women, participants with and without health impairments, younger and older participants, and participants with different working hours in their subsidised job. Elderly welfare recipients and those with poor health have lower reemployment chances and may therefore benefit more from TA participation. Moreover, subsidised employment provides a good opportunity to overcome employers' prejudices (e.g., lower productivity) and reduces their financial risk. We also expected men to benefit more than women, as they work on average more hours (Wanger, 2020) and earn higher wages. Moreover, traditional gender roles suggest a higher importance of employment for men, as women are more likely to adopt alternative roles apart from employment, such as being a mother or a homemaker (McFayden, 1995; Paul & Moser, 2009). We also expected higher effects for employees working full-time, as they earn more compared to those working part-time.

H3. Programme effects are more pronounced for participants with health impairments, for men, for older participants and for full-time workers.

DATA AND METHOD OF ANALYSIS

The analyses drew on the panel survey 'Quality of Life and Participation', conducted for evaluating the effects of the TA programme on employability and social participation. The project is part of the evaluation of the Participation Opportunities Act that the Institute for Employment Research is conducting on behalf of the German Federal Ministry of Labour and Social Affairs. The data collection consisted of four steps. First, administrative data were used to identify programme participants and a base sample of non-participants.

In a second step, administrative data were used again to identify an appropriate control group of non-participants from the base sample via matching methods.

The identified group of programme participants and their control group were then surveyed in a third step. Finally, in a fourth step, programme effects were evaluated on the basis of the sample that could be interviewed, using a refined matching approach. In the following part, each of the four steps will be laid out in more detail and the identifying assumptions of the matching process will be discussed.

Construction of treatment and control sample

Two cohorts with programme start dates between April and July 2019 and September and December 2019 were drawn using administrative data (Step 1). The sample was restricted to people 60 years of age or younger, to ensure that sample members can still be observed in the programme at later survey waves. Also, participants in specific predecessor programmes were excluded to obtain a sample of new programme entrants.¹ Because of the first cohort's large size, a random sample of 6900 of the total of 10,835 participants was drawn, while the second cohort includes the complete group with a start date falling within the pre-defined period. The base samples for the control groups consist of 50% random samples of all welfare recipients on 31 March 2019 (cohort 1) and 31 August 2019 (cohort 2), respectively, who did not participate in the programme until the end of the sample's respective programme start time window.

In a second step, for each treated person, 12 non-participants were selected from the control group base samples by means of propensity score matching on the basis of administrative data. This allowed us to draw a control group that closely resembled the treatment group and who could have participated in the programme with almost the same probability as estimated on the basis of characteristics available in the administrative data. Covariates that entered the matching procedure included socio-demographic characteristics, employment, welfare benefit receipt, and programme participation histories, as well as household and regional characteristics (Table A4).

In a third step, the identified gross sample was targeted via telephone. The goal was to interview two to three control persons per interviewed participant. The survey was organised as a four-wave panel, with interviews taking place in 2020, 2021, 2023, and 2025, respectively. The present analysis used data from the first two waves, in which a total of 17,025 interviews were

completed. The first wave took place between May 2020 and March 2021 with a response rate of 17.4%, the second between April 2021 and March 2022 with a response rate of 74.8% of wave 1 respondents (see Hülle et al., 2022). Since treatment and control cases were freshly assigned to each other in the final estimation step (see section [Discussion of Identifying Assumptions](#)), each treatment case has corresponding control cases, even in case none of the participant's 12 controls from the gross sample could be reached.

The median time interval between the two interviews was 11.5 months. Therefore, our analysis examined participants' outcomes approximately 1 and 2 years after programme start. For present analysis, we created a balanced sample, consisting of survey respondents to both waves. Sample members with missing values on any of the dependent variables were excluded (9%). After these adjustments, our net balanced sample amounted to 13,206 interviews in waves 1 and 2 for 2078 programme participants and 4525 potential controls.

In a final fourth step, this net sample was used to estimate causal effects of programme participation using radius calliper matching. Programme participants were matched with non-participants on a large number of administrative and survey variables (Table A4). In this final matching, the final control group (matched control group) to be compared with the treatment group was identified. Sample members with missing values on regional variables or with completely missing administrative data (0.1%) were excluded from the analysis sample. We also excluded the 2% of sample members who were in contributory employment in the sampling month, as our research questions refer to transitions from unemployment to employment.

Table 1 shows average values of selected variables for the gross sample (after Step 2) and the net sample (before and after Step 4, respectively). Selection on education between the gross and the net sample appears most noteworthy, with more educated individuals more likely to take part in the survey. Furthermore, individuals with a partner and/or children or without German citizenship were less likely to respond. To account for this selection, we weighted the final sample on the basis of the gross sample. Table 1 also demonstrates the importance of controlling for survey variables that were not available in the administrative data, such as pre-existing health impairments.

Discussion of identifying assumptions

This section lays out specifics of the matching method used to identify causal effects of participation in the TA programme on health and material well-being outcomes.

¹A total of 2% of TA participants from the described starting cohorts were excluded from the gross sample due to missing information in the administrative data.

TABLE 1 Means of selected key variables for treated and controls in gross and net sample, before and after Step 4.

	Gross sample with 12 pre-matched controls per treated individual			Net sample of treated and controls who were successfully interviewed in waves 1 and 2					
				Before Step 4			After Step 4 (radius calliper matching)		
	Mean treated	Mean controls	sig.Δ	Mean treated	Mean controls	sig.Δ	Mean treated	Mean controls	sig.Δ
Variables from administrative data									
Interaction gender/region/cohort									
Women, east, cohort 1	8%	8%		8%	9%		8%	8%	
Men, east, cohort 1	11%	11%		12%	13%		12%	12%	
Women, west, cohort 1	13%	13%		13%	14%		13%	13%	
Men, west, cohort 1	22%	22%		21%	22%		21%	21%	
Women, east, cohort 2	7%	7%		7%	6%		7%	7%	
Men, east, cohort 2	8%	8%		9%	8%		9%	9%	
Women, west, cohort 2	14%	14%		13%	11%	**	13%	13%	
Men, west, cohort 2	18%	18%		17%	16%		17%	17%	
Average age at sampling date (years)	46.2	46.2		48.1	48.0		48.1	48.0	
Level of education									
Less than upper secondary	43%	44%		31%	32%		31%	29%	
Upper secondary or vocational degree	52%	52%		63%	62%		63%	64%	
Tertiary degree	4%	4%		6%	6%		6%	6%	
Missing	1%	1%		0%	0%		0%	0%	
Household (Bedarfsgemeinschaft) type									
Single	60%	60%		65%	65%		65%	65%	
Lone parent	16%	16%		13%	14%		14%	14%	
Couple without children	10%	10%		10%	10%		10%	10%	
Couple with children	13%	13%		9%	9%		9%	9%	
Household type missing	2%	2%		2%	2%		2%	2%	
Without German citizenship	11%	11%		7%	6%		7%	7%	
Disability	6%	6%		8%	9%		8%	8%	
Total employment duration in last 7 years									
0 days	42%	43%	***	40%	42%		40%	40%	
>0 days-<1 year	34%	34%		35%	35%		35%	36%	
≥1-<2 years	10%	9%		9%	10%		9%	10%	
≥2-<4 years	9%	8%	**	9%	9%		9%	9%	
≥4-<6 years	3%	3%		3%	3%		3%	3%	
≥6 years	2%	2%	***	3%	1%	***	3%	3%	

(Continues)

TABLE 1 (Continued)

	Gross sample with 12 pre-matched controls per treated individual			Net sample of treated and controls who were successfully interviewed in waves 1 and 2					
	Mean treated	Mean controls	sig.Δ	Before Step 4			After Step 4 (radius calliper matching)		
				Mean treated	Mean controls	sig.Δ	Mean treated	Mean controls	sig.Δ
Variables from survey data									
Serious health impairment diagnosed before 2019									
Cardiovascular				9%	14%	***	9%	8%	
Musculoskeletal				22%	32%	***	22%	22%	
Mental disorder				16%	26%	***	16%	15%	
Other				25%	33%	***	26%	25%	
N	13,033	156,396		2005	4321		1982	4212	

Note: Analysis sample excluding people with contributory job in sampling month, and excluding people with missing outcome values.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Let the outcome value after participation started be $Y(1)|D = 1$ and the outcome value, if participation never starts or had not yet started be $Y(0)|D = 1$. $D = 1$ denotes a participant, while $D = 0$ represents a non-participant. For a participant, the causal effect of participation in the programme is represented by the difference between $Y(1)|D = 1$ and $Y(0)|D = 1$. As we can only observe the first of these two outcome values for participants, the causal effect for participants is never observed directly, known as the fundamental evaluation problem (Roy, 1951; Rubin, 1974).

We addressed this problem by applying propensity score matching to our sample of participants and non-participants who could have started a participation in the same period. The participation probability is given by $P(D = 1|X) = P(X)$, where X represents covariates that both affect the participation probability and the outcomes. Using radius calliper matching, we then chose for each participant all non-participants whose propensity scores differs—in absolute terms—by no more than a chosen threshold from that of the participant.² The average difference between the participant's outcome value and the average value of the outcome for the controls

matched to this participant over all participants is the estimated average treatment effect on the treated (ATT).

Under certain conditions, propensity score matching yields consistent estimates of the treatment effect (Caliendo & Kopeinig, 2008; Sianesi, 2004). We assumed a non-zero probability of not participating in the programme, $P(D = 1|X) < 1$. A zero probability of not participating would make it impossible to find non-participants with a similar participation probability. Figure A1 shows that only two participants had to be excluded because their participation probability was higher than that of any controls. Next, the weak unconfoundedness condition given the propensity score implies that the outcome without treatment, $Y(0)$, is independent of treatment given the propensity score. If this assumption holds, there is no selection on observables. If the vector of determinants of the propensity score is sufficiently rich, and key unobservable determinants of the potential outcomes are highly correlated with X , our approach might indirectly deal with selection on unobservables.

The standardised absolute bias measures selection on observables as the difference of the sample mean of a covariate between participants and controls, as a percentage of the square root of the average sample variance of the participant and control sample (Caliendo & Kopeinig, 2008). The average of this measure over all covariates is the mean standardised absolute bias (MSB). An MSB after matching of three to five indicates a considerable match quality (Caliendo & Kopeinig, 2008). Table 2 shows that the MSB was below two for each of the subgroups in our analysis, indicating a good match quality.

²We chose radius calliper matching as it performed best compared to one-to-one and one-to-five nearest neighbour matching as indicated by the mean standardised absolute biases. To choose a calliper, we first carried out a one-to-one nearest neighbour matching with replacement and used the 99th percentile of the absolute values of the propensity score differences between the participants and their matched controls. This leads to dropping the 1% of the treatment group with the worst matches to their first nearest neighbour. Propensity score matching was combined with direct matching on participation cohort.

TABLE 2 Mean standardised absolute bias before and after post-matching on probability of TA participation.

	Mean bias before post-matching	Mean bias after post-matching	Diff mean bias %
Overall sample	3.45	0.89	74.1
Men	4.32	1.22	71.9
Women	4.75	1.41	70.4
Prior health impairments	4.23	1.26	70.3
No prior health impairments	4.00	1.38	65.5
Age <50	4.18	1.17	72.0
Age ≥50	4.32	1.46	66.2
≤25 h	9.93	1.41	85.8
>25–30 h	6.40	1.64	74.5
>30 h	7.34	1.03	85.9

Note: Radius calliper matching with 99th percentile of propensity score difference to first nearest neighbour as calliper, exact matching on cohort. See Table A2 for sample sizes and callipers.

The matching approach relies on the stable unit treatment value assumption (Frölich, 2004; Rubin, 1980), assuming that the outcomes of a person are independent of the participation of others. This is likely to hold as TA participant numbers are quite low.

Descriptive statistics

In the following section, we provide a descriptive overview of the collected survey data used in this study. For participants and non-participants in the TA programme in our sample, the gender ratio was slightly in favour of men, with a share of about 60% (see Table 3).

A mere 10% of the respondents was younger than 36 years at the time of the first interview and more than half of the respondents was already 50 years or older. The majority of respondents was single and had vocational training. The share of respondents with university degrees was low, at less than 10%. About one in four respondents had a migration background. Respondents were considered as having a migration background if they were born abroad or if one of their parents was born abroad. Considering the basic sociodemographic variables, it is clear that the potential control and treatment group were quite similar.

As expected, the majority of the treatment group was in employment at both interviews (Table 4). Jobs in the TA programme are required to be socially insured jobs. Of the control group, 14% were likewise in contributory employment at wave 1, and 19% at wave 2. In addition, approximately 10% of the control group were in uninsured minijobs at both waves.³ As described in the section [Programme Description and Background](#), using

administrative data for a similar time frame as our wave 1, Tübbicke and Kasrin (2023) found a lower unsubsidised contributory employment rate of only 4.8% for their TA matched control group. This difference in findings is likely to be due, in part, to survey selection into our net sample, as becomes evident in Table 1.⁴ For this reason, we applied survey weights in our final matching analysis. This weighting led to larger effect estimates, since more disadvantaged programme participants tended to profit more from participation. It is likely that we still somewhat underestimated the effect sizes, since the survey weights might not have been able to entirely correct for the response bias.

Up to the interviews of the second wave, the employment rate slightly decreased for the treatment group, as some participants dropped out of the TA programme early. The share of part-time employment in the treatment group was 49% in the first wave and 43% in the second. Notably, the share of fixed-term job contracts in the treatment group was on a relatively high level in both waves. Altogether, a majority of 74% of the treatment group, on average, fulfilled one of the two elements of non-standard employment, that is, part-time employment or fixed-term job contracts, while the majority of the potential control group was unemployed.

Index values for material resources and health

In both waves, the survey asked programme participants and non-participants about their material resources and

³Minijobs are jobs that pay no more than 520 Euros a month. They are not subject to social insurance contributions.

⁴In part, the difference may also be attributable to the fact that for the control group, we cannot distinguish subsidised from unsubsidised employment in the survey, and part of their employment might be subsidised.

TABLE 3 Population shares by demographic and socioeconomic variables.

	Potential ^a control group	Treatment ^b group
Female	40.4	40.8
Age groups		
<36 years	9.6	9.3
36–49 years	34.4	33.4
≥50 years	56.0	57.3
Family type		
Single	64.8	64.1
Partner, no children	12.0	12.7
Single, with children	13.8	12.8
Partner, with children	9.4	10.4
Migration background	24.8	23.2
Qualification		
No qualification	25.3	23.3
Vocational training	61.1	62.7
Foremen/technician	4.4	4.5
University degree	9.3	9.5
Observations	4525	2078

Note: Results represent shares in per cent for respective demographic and socioeconomic variables.

^aPotential control group refers to the sub-sample of non-participants surveyed, from which the matched control group is formed on the basis of radius calliper matching.

^bBefore applying radius calliper matching.

participation in social activities, health status, satisfaction with health and satisfaction with standard of living. In wave 1, the questions on material resources and participation in social activities were framed so as to apply to the time before the COVID-19 pandemic, but after beginning TA participation. In wave 2, the questions applied to the time of interview, during the COVID-19 pandemic. The two satisfaction outcomes were each measured on an 11-point scale.⁵ To keep the collection of questions on material resources (seven questions) and health status (three questions) manageable, polychoric principal component analyses were implemented as dimension reduction procedures to identify mutual components of each

topic and to be able to orthogonally delineate them from each other.⁶ We identified two dimensions for material resources. The first dimension (material participation) comprised the presence of durables that are typically supportive of participating in working life, such as having a car.

The second dimension (participation in social activities) summarised participation in social activities, such as taking at least one vacation trip a year, as well as the respondents' financial resilience. In both dimensions, material resources were considered as non-existent if respondents reported that they lacked the resources for financial reasons. For health status, we identified one dimension that covers general and mental health, as well as vitality. Having assigned the survey items to the two dimensions of material resources and one dimension of health status, we predicted mean-centred scores for each dimension's first principal component from principal component analysis. Since the distance between predicted mean-centred scores of a principal component defies intuitive interpretation, we rescaled the scores for the first principal component of each dimension into a uniform index ranging from zero to 100. Respondents reached the lower bound (upper bound) of an index if they reported the lowest (highest) value on all underlying questions of the dimension. This operationalisation provides an economic interpretation of dimension values and enables a comparison of index values between dimensions.

ESTIMATION RESULTS

In this section, the estimation results in Tables 5 and 6 will be presented and discussed. Table A3 displays absolute outcome levels for the matched control group, against which the treatment effects can be interpreted. For instance, Table A3 shows that without treatment, the programme participants' average level of satisfaction with their standard of living on a scale of 0–10 would have been 5.77 in wave 1 and 5.80 in wave 2. Table A2 in Appendix A shows the sample sizes for all variables used in the analysis, as well as the callipers used in the radius matching. The following subsections show the effects of programme participation on health and material well-being, respectively.

⁵The wording of the survey questions can be found in Table A1 in Appendix A.

⁶Since questions on material resources and health status are binary and ordinally scaled, respectively, we employed estimated polychoric correlation matrices for the analyses and predictions. The results of the principal component analyses are available from the authors.

TABLE 4 Population shares by employment variables.

	Wave 1		Wave 2	
	Potential control group ^a	Treatment group ^b	Potential control group ^a	Treatment group ^b
Amongst all				
Employment subject to social insurance contributions	14.2	88	18.6	79.5
Minijob: employment not subject to social insurance contributions	11.3	0.6	10.4	1.1
Part-time employed	18.7	48.7	19.6	43.0
Fixed-term job contract	13.0	70.9	13.9	58.5
Amongst employed				
Part-time employed	76.1	54.9	70.9	53.9
Fixed-term job contract	51.6	80.0	48.3	73.0
Minijob: Not subject to social insurance contributions	41.6	0.7	33.8	1.3
Observations	4525	2078	4525	2078

Note: Results represent shares in per cent for respective demographic and socioeconomic variables. Employment includes both unsubsidised and subsidised employment. Part-time employed work less than 30 h per week.

^aPotential control group refers to the sub-sample of non-participants surveyed before applying radius calliper matching, which is then used to form the matched control group in a next step.

^bBefore applying radius calliper matching.

Effect of programme participation on health

Table 5 displays effects of programme participation on the two health indicators given by the level of health satisfaction and the composite index on health status (see the [Data and Method of Analysis](#) section on Index Values for Health). Moreover, Table 5 displays 90% confidence intervals for the estimated effects in both waves. To test for subgroup heterogeneity, the table also presents separate estimates by gender, pre-existing health impairments, age group, and working hours for both waves.

The estimated effects for the first outcome indicate that TA participants had a significantly higher level of satisfaction with their health by 1.00 scale point compared to their matched control group. This effect estimate declined somewhat, albeit not significantly, from wave 1 to wave 2. The effects were also significant for all subgroups and did not decrease over time. We also find higher effects on health satisfaction for participants working over 30 h per week compared to those working up to 25 h in wave 2. In line with the health satisfaction results, health index values for TA participants are 9.42 percentage points higher than for the matched controls in wave 1. The effect dropped significantly to 6.22 percentage points in wave 2, but remains large in magnitude. Moreover, effects for the subgroups do not

significantly fall between waves, except for women and for participants without health impairments.⁷

These results confirm that TA participants' mental and physical health improved through participation, providing support for Hypothesis H1a. Moreover, we found higher effects for older compared to younger participants in both waves (with the exception of the health index in wave 2), and higher effects on health satisfaction for participations working full-time compared to those working up to 25 h in wave 1. The observed age heterogeneity in effects on health provides partial support for Hypothesis H3.

To assess the magnitude of the health effects, we compared our results to those shown in Eggs et al. (2014), who report the health satisfaction of unemployed welfare recipients as well as employed persons not on welfare for Germany in 2012 using the same indicator as ours. Based on their results, employed persons not on welfare have a 1.8 scale points higher health satisfaction compared to unemployed welfare recipients, while our results show a

⁷Implications of the COVID-19 pandemic (coinciding with waves 1 and 2) for health effects are ambiguous. On the one hand, less social contacts for the control group might affect mental health, leading to greater health effects than without the pandemic. On the other hand, participants may have had a higher risk of contracting COVID-19 at work, resulting in less beneficial health effects than without the pandemic.

TABLE 5 Effect of TA participation on indicators of health.

	Effect on ...					
	Health satisfaction on a scale of 0–10			Health-based quality of life—percentage of maximum PCA score		
	ATT	Confidence interval (90%)		ATT	Confidence interval (90%)	
Wave 1 (May 2020–March 2021)						
Full sample	1.00***	0.88	1.12	9.42***	8.35	10.50
Men	1.05***	0.89	1.20	10.13***	8.81	11.44
Women	0.94***	0.78	1.11	9.21***	7.37	11.04
Prior health impairments	1.00***	0.83	1.17	8.86***	7.15	10.57
No prior health impairments	0.91***	0.77	1.05	9.40***	8.06	9.04
Age <50	0.83***	0.68	0.99	7.51***	6.15	8.87
Age ≥50	1.18***	1.00	1.36	12.71***	11.07	14.35
≤25 h	0.79***	0.55	1.03	9.33***	6.98	11.68
>25–30 h	1.05***	0.84	1.27	10.54***	8.59	12.49
>30 h	1.00***	0.83	1.16	9.26***	7.80	10.72
Wave 2 (April 2021–March 2022)						
Full sample	0.85***	0.73	0.96	6.22***	5.15	7.28
Men	0.99***	0.86	1.13	7.85***	6.49	9.20
Women	0.69***	0.51	0.87	5.45***	3.63	7.27
Prior health impairments	0.80***	0.64	0.97	5.49***	3.79	7.19
No prior health impairments	0.78***	0.63	0.92	5.96***	4.48	7.45
Age <50	0.72***	0.57	0.86	6.28***	4.71	7.86
Age ≥50	0.99***	0.82	1.17	7.90***	6.36	9.44
≤25 h	0.54***	0.33	0.75	5.22***	2.81	7.63
>25–30 h	0.74***	0.51	0.97	7.86***	5.63	10.09
>30 h	1.02***	0.85	1.20	6.44***	4.93	7.94

Note: Weighted average treatment effects on the treated (ATTs). Radius calliper matching with 99th percentile of propensity score difference to first nearest neighbour as calliper, exact matching on cohort, bootstrapped standard errors, weighted. See Table A2 for sample sizes and callipers.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

difference of 1.00 scale point between participants and their matched control group. Therefore our results show that the health satisfaction of participants in the TA programme lies between unemployed welfare recipients and employed persons not in welfare, which is a promising result.

A relevant study by Ivanov et al. (2020) examined the effect of mental health for participants in the predecessor wage subsidy programme ‘Soziale Teilhabe am Arbeitsmarkt’, using a matching approach. However, the magnitude of these effects cannot be compared to our findings, since our health index encompasses both physical and mental health, and is a composite index with a completely different scale. The study found that participants with health impairments have greater health effects compared to those without health impairments, thus differing from our finding of no effect heterogeneity with

respect to pre-existing health impairments on health outcomes.

Effect of programme participation on material well-being

Table 6 presents the estimation results (ATTs) of participating in the TA programme on satisfaction with standard of living, followed by its effects on material well-being, given by the index on material participation and the index on material resources for participation in social activities (which also includes financial resilience), respectively.

The results show that satisfaction levels with standard of living, as well as the indexes measuring material well-being were significantly higher for programme

TABLE 6 Effect of TA participation on indicators of material well-being.

	Effect on ...								
	Satisfaction with standard of living on a scale of 0–10			Material participation—percentage of maximum PCA score			Participation in social activities—percentage of maximum PCA score		
	ATT	Confidence interval (90%)		ATT	Confidence interval (90%)		ATT	Confidence interval (90%)	
Wave 1 (May 2020–March 2021)									
Full sample	1.40***	1.30	1.49	6.32***	5.29	7.34	15.31***	14.00	16.62
Men	1.48***	1.36	1.59	7.50***	6.19	8.81	18.09***	16.54	19.64
Women	1.29***	1.16	1.43	4.95***	3.67	6.23	11.75***	9.87	13.63
Prior health impairments	1.24***	1.11	1.38	5.24***	3.70	6.78	15.32***	13.00	17.65
No prior health impairments	1.46***	1.33	1.59	7.11***	5.93	8.28	16.42***	14.73	18.11
Age <50	1.26***	1.13	1.38	4.95***	3.75	6.14	12.08***	10.24	13.92
Age ≥50	1.62***	1.47	1.77	8.06***	6.49	9.64	19.26***	17.30	21.22
≤25 h	1.01***	0.81	1.21	5.37***	3.61	7.12	13.85***	11.28	16.41
>25–30 h	1.47***	1.31	1.62	7.42***	5.60	9.24	15.02***	12.87	17.18
>30 h	1.54***	1.41	1.68	6.69***	5.36	8.01	17.19***	15.35	18.03
Wave 2 (April 2021–March 2022)									
Full sample	1.08***	0.99	1.18	6.40***	5.46	7.34	12.92***	11.58	14.25
Men	1.12***	1.00	1.24	7.25***	6.09	8.41	15.38***	13.63	17.12
Women	0.99***	0.84	1.15	4.80***	3.07	6.32	9.23***	7.27	11.18
Prior health impairments	1.03***	0.88	1.17	4.65***	3.06	6.25	13.33***	11.13	15.51
No prior health impairments	1.10***	0.96	1.23	8.36***	7.11	9.60	13.84***	12.06	15.62
Age <50	1.01***	0.88	1.13	4.01***	2.78	5.25	9.55***	7.63	11.46
Age ≥50	1.26***	1.10	1.42	10.26***	8.72	11.79	19.12***	17.24	20.99
≤25 h	1.14***	0.92	1.35	5.42***	3.61	7.24	8.83***	5.92	11.74
>25–30 h	1.10***	0.93	1.27	7.77***	6.04	9.51	14.88***	12.70	17.05
>30 h	1.07***	0.92	1.22	6.80***	5.23	8.36	15.70***	13.77	17.62

Note: Weighted average treatment effects on the treated (ATTs). Radius calliper matching with 99th percentile of propensity score difference to first nearest neighbour as calliper, exact matching on cohort, bootstrapped standard errors, weighted. See Table A2 for sample sizes and callipers.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

participants compared to their matched controls in both survey waves. The first column in Table 6 shows an ATT of 1.40 for satisfaction with standard of living for the full sample in wave 1, showing a higher satisfaction with standard of living of 7.17 points for TA participants compared to 5.77 points for the matched control group (see first column of Table A3). This effect significantly drops to 1.08 points in wave 2. Nevertheless it remained a sizable effect, with the treatment group scoring 6.88 points on the standard of living satisfaction scale compared to 5.80 points for their matched control group in wave 2. The drop in satisfaction levels over survey waves could be due to adjusted expectations of participants' and/or to participants' dropping out of the programme over time.

To help assess the magnitude of this effect, we compare our findings to those of Ivanov et al. (2020), who examined the effect of participating in the 'Soziale Teilhabe am Arbeitsmarkt' programme on life satisfaction, which is measured on the same scale as our measure on satisfaction with standard of living. Following Fryer's Agency Restriction Model (1986), satisfaction with standard of living is an important determinant of life satisfaction, especially for individuals at the lower end of the income spectrum, which is the case for welfare recipients. Nevertheless, life satisfaction also depends on other factors and hence our results are not directly comparable to those of Ivanov et al. (2020). The authors found that the life satisfaction of participants' is 0.58 points and 0.53 points higher compared to that of their matched group of

non-participants in the first and second wave, respectively. Our results for the first two waves amount to 1.40 and 1.10 points. This is an indicator that the TA programme seems to be performing quite well compared to the predecessor wage subsidy programme with respect to participants' satisfaction with their standard of living.

The subgroup analysis shows that all subgroups benefit from a higher level of satisfaction with their standard of living compared to their matched control groups in both waves. However, the magnitude of the effects dropped significantly between wave 1 and wave 2 for all subgroups, except for the subgroup of participants with prior health impairments and for those who work up to 25 h per week. We also find some subgroup heterogeneity by age and working hours in wave 1. However, these heterogeneities were not stable over time.

Results for the index on material participation show significantly higher values for TA participants compared to the matched control group of non-participants of 6.32 points, with overlapping confidence bands indicating no significant difference in effect size between the two waves.⁸ We also found significant effect heterogeneity by age in both waves, where older participants have a higher index on material participation compared to younger participants. The index on material resources for participation in social activities in the last column of Table 6 is also significantly higher for participants compared to their control group, with a difference of 15 points. The effect did not drop significantly between waves. For this index, we found higher effects for male than female participations in both waves. In wave 2, participants working more than 30 h had a higher social participation index compared to those working up to 25 h. Similar to the results for the material participation index, we also find significant heterogeneity by age group, where older participants have sizably larger effects than younger participants in both waves.

Our results on the effects of participation in TA on material well-being show that participation in TA increased the subjective satisfaction with standard of living as well as the indexes on material well-being, which provides support for Hypothesis H2. The results also confirm higher effects of the employment subsidy programme on both material well-being indexes for older compared to younger participants and higher effects on social participation for males compared to females, providing partial support for Hypothesis H3.

The results in this section highlight that, although jobs subsidised within the TA programme were mostly in

non-standard employment, they generated positive effects for participants in both waves. Thus, for the programme's specific interest group of long-term benefit recipients with very low employment prospects, this largely fixed-term and part-time subsidised employment did appear to be beneficial for health outcomes and material well-being. Moreover, the stability of the results for the indicators on the total sample over time shows that the estimates were not affected by participants dropping out of the programme or by the increase of employment rates in the control sample between wave 1 and wave 2. The results also showed significant effect heterogeneity by age in both survey waves for most indicators, highlighting that older participants usually benefit more from participation in the TA programme than younger participants (Hypothesis H3).

CONCLUSION

Our study analysed effects on health outcomes and material resources of welfare recipients who were employed with the support of the recently introduced wage subsidy 'Teilhabe am Arbeitsmarkt' (TA). This subsidy targets welfare recipients who otherwise would have almost no prospects of finding a socially insured job. The aim of the subsidy is not only to improve the employment prospects of long-term welfare recipients, but also to improve their social integration and well-being, of which health and material well-being are integral parts.

On the one hand, some characteristics of the subsidised jobs suggest a good employment quality. For instance, the subsidy is available only for employment that is subject to social security contributions, and employers are required either to pay the minimum wage or wages that are outcomes of wage bargaining between employers and unions. On the other hand, the majority of the jobs in the programme are non-standard, in that they are fixed-term and/or part-time. Indeed, special regulations allow these jobs to remain fixed-term for longer durations than would apply to regular jobs, so as to motivate employers who would otherwise be reluctant to hire long-term welfare recipients to participate. Moreover, approximately half of the jobs are part-time, enabling people with health impairments or care obligations to take part. Against this background, our study investigated whether entering jobs subsidised by TA can positively affect health and material well-being, despite the non-standard nature of the subsidised jobs.

We focus on the outcomes of health and material well-being because predictions for these outcomes based on the characteristics of the subsidised are not clear-cut, thus necessitating empirical investigation. While in

⁸Because of the different framing of the questions on material resources no significant differences across the waves also means that there are no significant changes before and after the COVID-19 pandemic.

general, entering employment from unemployment can be expected to positively affect health and material well-being based on theoretical grounds (Ezzy, 1993; Fryer, 1986; Jahoda, 1982), expectations for non-standard employment are less clear. For instance, non-standard employment is associated with stress- and health-related risks (Böhnke et al., 2016; Chandola & Zhang, 2018; Hünefeld, 2018; Tophoven & Tisch, 2016), and part-time jobs provide lower earnings.

Our analysis is based on the panel survey ‘Quality of Life and Participation’, which was conducted specifically for the purpose of evaluating the effects of the TA programme on employability and social participation. Our evaluation applied a propensity score matching approach, making use of linked survey and administrative data. The interview dates of wave 1 and wave 2, when our outcomes were measured, are around one and around 2 years after the programme participation started.

Our results clearly show that at the interview dates of both wave 1 and 2, the different health outcomes were positively affected by participation and hence by working in non-standard employment. We found these positive effects despite the subsidised jobs being predominantly non-standard fixed-term or part-time jobs, indicating that the subsidised employment did not seem to overwhelm participants’ beyond their mental or physical capabilities. This supports Hypothesis H1a.

Our study adds to a growing literature that looks into the effects of wage subsidies and employment programmes on health outcomes. Our findings are in line with those of studies for Germany and Sweden that analysed subsidised contributory employment programmes (Ivanov et al., 2020; Korpi, 1997; Strandh, 2001). All indicators of material well-being that we studied were likewise positively affected by TA participation, as expected according to Hypothesis H2.

The variation of the effects over different groups provides some indications regarding which groups benefit most and how to design the policy. Welfare recipients at least 50 years of age were more positively affected by participation than younger welfare recipients. This holds for material well-being as well as for the health indicators, which supports Hypothesis H3. Thus, it is useful for job centres to target welfare recipients who are at least 50 years old. Moreover, we found evidence in wave 1 that working over 30 h a week in the subsidised job is related to higher satisfaction with health and with standard of living compared to working up to 25 h a week. This suggests that it would be a good strategy for job centres to more frequently subsidise jobs with a working week of more than 30 h. Higher working hours are likely to improve earnings and are thus of considerable importance for improving the standard of living. A strategy of placing participants into jobs with more than 30 working

hours a week is of course only a strategy for participants who are capable of working full-time.

While we consistently found positive effects for participants with prior health impairments on all our material well-being and health outcomes, these effects were not significantly higher than for participants with no such impediments. The findings of positive effects for participants with health impairments is important, as the TA programme was created to help welfare recipients with considerable barriers in taking up a job, even with the support of other ALMPs (like training programmes, other wage subsidies or job creation schemes). Welfare recipients with health impairments who qualify according to the formal rules for TA participation are clearly a group in need of this kind of support.

It is important to note that our study is limited to an observation window that is too short to make any statements about the effects of the programme on participants after its maximum duration of 5 years. It is likely that the estimated effect sizes will not persist once the subsidised employment is terminated, and they already began to fall between the interviews of the first and second wave, even though the reduction was mostly not statistically significant. It clearly remains important to see whether some of the effects, at least partly, persist over a longer period, and whether former participants improved their employability and could find employment more frequently than without participation. Moreover, some changes in their lifestyle while participating might also allow positive effects on health to (partly) persist, at least for a while, after participation ends. For participants who, prior to their subsidised employment, received welfare benefit for very long periods and were not employed, this would be a major achievement. As we will conduct a wave after the maximum duration of the respondents’ TA participation is reached, we can shed light on this issue in the future. However, the results clearly imply that taking up non-standard employment can have considerable beneficial effects on material well-being and health for a group of disadvantaged welfare recipients, provided that the alternative is no employment at all or extremely low prospects of a transition into employment.

ACKNOWLEDGMENT

Open Access funding enabled and organized by Projekt DEAL.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Due to its linkage with respondents’ administrative records, data access is restricted to members of the project’s research team.

ORCID

Maximilian Schiele  <https://orcid.org/0000-0003-0650-6195>

REFERENCES

- Bauer, F., Bennett, J., Coban, M., Dietz, M., Friedrich, M., Fuchs, P., Gellermann, J., Globisch, C., Gottwald, M., Kupka, P., Nivorozhkin, A., Promberger, M., Ramos Lobato, P., Wenzig, C., Wolff, J., Zabel, C., & Zins, S. (2021). Evaluation der Förderinstrumente nach § 16e und § 16i SGB II-Zwischenbericht [Evaluation of the employment programmes according to § 16e and § 16i SGB II interim report]. *IAB-Forschungsbericht*, No. 03/2021.
- Berthoud, R., Bryan, M., & Bardasi, E. (2004). *The dynamics of deprivation: The relationship between income and material deprivation over time*. Department for Work and Pensions.
- Beste, J., Bethmann, A., & Gundert, S. (2014). Materielle und soziale Lage der ALG-II-Empfänger [Material and social situation of ALG II recipients]. *IAB Kurzbericht*, No. 24/2014.
- Blömer, M., & Peichl, A. (2020). Für wen lohnt sich Arbeit? Partizipationsbelastungen im Steuer-, Abgaben- und Transfersystem [For whom does work pay off? Participation burdens in the tax, contribution and transfer system]. *Ifo Forschungsbericht*, No. 118.
- Böhnke, P., Renneberg, A. C., & Cifuentes, I. V. (2016). Atypische Beschäftigung und Gesundheit in Europa [Atypical employment and health in Europe]. *WSI-Mitteilungen*, 69(2), 113–120. <https://doi.org/10.5771/0342-300X-2016-2-113>
- Brand, J. E. (2015). The far-reaching impact of job loss and unemployment. *Annual Review of Sociology*, 41, 359–375. <https://doi.org/10.1146/annurev-soc-071913-043237>
- Bundesministerium für Arbeit und Soziales. (2021). Lebenslagen in Deutschland – Der Sechste Armuts- und Reichtumsbericht der Bundesregierung [Life situations in Germany – The German Federal Government's 6th Report on Poverty and Wealth].
- Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*, 22(1), 31–72.
- Carlier, B. E., Schuring, M., Lötters, J. B. F., Bakker, B., Borgers, N., & Burdorf, A. (2013). The influence of re-employment on quality of life and self-rated health, a longitudinal study among unemployed persons in the Netherlands. *BMC Public Health*, 13(1), 503. <https://doi.org/10.1186/1471-2458-13-503>
- Chandola, T., & Zhang, N. (2018). Re-employment, job quality, health and allostatic load biomarkers: Prospective evidence from the UK Household Longitudinal Study. *International Journal of Epidemiology*, 47(1), 47–57. <https://doi.org/10.1093/ije/dyx150>
- Christoph, B., & Lietzmann, T. (2013). Je länger, je weniger? Zum Zusammenhang zwischen der Dauer des ALG-II-Leistungsbezugs und den materiellen Lebensbedingungen der Betroffenen [The longer, the less? On the relationship between the duration of ALG II benefit receipt and the material living conditions of the people concerned]. *Zeitschrift für Sozialreform*, 59(2), 167–196.
- Clark, A. E., & Oswald, A. J. (1994). Unhappiness and unemployment. *The Economic Journal*, 104(424), 648–659. <https://doi.org/10.2307/2234639>
- Coutts, A. P., Stuckler, D., & Cann, D. J. (2014). The health and wellbeing effects of active labor market programmes. In *Well-being: A complete reference guide* (pp. 1–18). John Wiley & Sons. <https://doi.org/10.1002/9781118539415.wbwell048>
- Dauth, W., Dorner, M., & Blien, U. (2013). Neukonzeption der Typisierung im SGB-II-Bereich. Vorgehensweise und Ergebnisse. [Reconceptualization of the regional typology for the Social Code II. Approach and results]. *IAB-Forschungsbericht*, No. 11/2013. <https://doku.iab.de/forschungsbericht/2013/fb1113.pdf>
- Dingeldey, I., Sopp, P., & Wagner, A. (2012). Governance des Einkommensmix: Geringfügige Beschäftigung im ALG-II-Bezug [Governance of the income mix: Marginal employment in ALG II receipt]. *WSI-Mitteilungen*, 65(1), 32–40. <https://doi.org/10.5771/0342-300X-2012-1-32>
- Eggs, J., Trappmann, M., & Unger, S. (2014). Grundsicherungsempfänger und Erwerbstätige im Vergleich: ALG-II-Bezieher schätzen ihre Gesundheit schlechter ein (No. 23/2014). *IAB-Kurzbericht*, No. 23/2014.
- Ezzy, D. (1993). Unemployment and mental health: A critical review. *Social Science and Medicine*, 37(1), 41–52.
- Frölich, M. (2004). Programme evaluation with multiple treatments. *Journal of Economic Surveys*, 18(2), 181–224.
- Fryer, D. (1986). Employment deprivation and personal agency during unemployment: A critical discussion of Jahoda's explanation of the psychological effects of unemployment. *Social Behaviour*, 1(1), 3–23.
- Fryer, D. (1997). Agency restriction. In N. Nicholson (Ed.), *The Blackwell encyclopedic dictionary of organizational psychology* (p. 12). Blackwell.
- Fryer, D., & Payne, R. (1986). Being unemployed: A review of the literature on the psychological experience of unemployment. In C. L. Cooper & I. Robertson (Eds.), *International review of industrial and organizational psychology* (pp. 235–278). John Wiley & Sons.
- Gallie, D., Paugam, S., & Jacobs, S. (2003). Unemployment, poverty and social isolation: Is there a vicious circle of social exclusion? *European Societies*, 5(1), 1–32. <https://doi.org/10.1080/1461669032000057668>
- Gundert, S., & Pohlan, L. (2022). Materielle und soziale Teilhabe: Mit dem Arbeitsplatz kann man mehr verlieren als nur den Job [Material and social participation: With the workplace, you can lose more than just your job]. *IAB-Kurzbericht*, No. 02/2022.
- Hammarström, A., Virtanen, P., & Janlert, U. (2011). Are the health consequences of temporary employment worse among low educated than among high educated? *European Journal of Public Health*, 21(6), 756–761. <https://doi.org/10.1093/eurpub/ckq135>
- Hoare, P. N., & Machin, M. A. (2010). The impact of reemployment on access to the latent and manifest benefits of employment and mental health. *Journal of Occupational and Organizational Psychology*, 83(3), 759–770. <https://doi.org/10.1348/096317909X472094>
- Hohmeyer, K., & Wolff, J. (2010). *Direct job creation in Germany revisited: Is it effective for welfare recipients and does it matter whether participants receive a wage?* Discussion Paper 21/2010. Institute for Employment Research. <https://doku.iab.de/discussionpapers/2010/dp2110.pdf>
- Hülle, S., Achatz, J., Coban, M., Friedrich, M., Gricevic, Z., Kiesel, M., Kleinemeier, R., Meß, A., Schels, B., Trappmann, M.,

- Wagemann, U., Wenzig, C., Wolff, J., Zabel, C., & Zins, S. (2022). Panel “Lebensqualität und Teilhabe” – Feld- und Methodenbericht der Welle 1. [Panel “Quality of Life and Participation” – Field and Method Report Wave 1]. *IAB-Forschungsbericht*, No. 08/2022.
- Hünefeld, L. (2018). Atypische Beschäftigung und psychische Gesundheit [Atypical employment and mental health]. *Arbeitsmedizin, Sozialmedizin, Umweltmedizin (ASU)*, 53, 32–37.
- Institut Arbeit und Qualifikation (IAQ), Leibniz-Zentrum für Europäische Wirtschaftsforschung (ZEW), Zoom, & Sozialforschung und Kommunikation (SOKO). (2019). Evaluation des Bundesprogramms “Soziale Teilhabe am Arbeitsmarkt” [Evaluation of the Federal Programme “Social Participation in the Labor Market”]. Final report. *BMAS Forschungsbericht*, 535.
- Institut für Sozialforschung und Gesellschaftspolitik (ISG), Institut für Arbeitsmarkt- und Berufsforschung (IAB), & Leibniz-Institut für Wirtschaftsforschung (RWI). (2011). Evaluation der Leistungen zur Beschäftigungsförderung nach §16e Abs. 10 SGB II. [Evaluation of employment promotion services according to §16e Abs. 10 SGB II.] Final report. *BMAS Forschungsbericht*, No. 413.
- Institut für Sozialforschung und Gesellschaftspolitik (ISG), Institut für Angewandte Wirtschaftsforschung (IAW), & Sozialforschung und Kommunikation (SOKO). (2021). Evaluation des ESF-Bundesprogramms zur Eingliederung langzeitarbeitsloser Leistungsberechtigter nach dem SGB II auf dem allgemeinen Arbeitsmarkt [Evaluation of the ESF Federal Programme for the Integration of Long-Term Unemployed Beneficiaries under Social Code Book II into the General Labor Market]. Final report. *BMAS Forschungsbericht*, No. 576.
- Ivanov, B., Pfeiffer, F., & Pohlen, L. (2020). Do job creation schemes improve the social integration and well-being of the long-term unemployed? *Labour Economics*, 64, 101836. <https://doi.org/10.1016/j.labeco.2020.101836>
- Jahoda, M. (1982). *Employment and unemployment: A social-psychological analysis*. Cambridge University Press.
- Kasrin, Z., Schiele, M., & Zabel, C. (2023). Effekte der Förderungen im Rahmen des Teilhabechancengesetzes auf die soziale Teilhabe der Geförderten: Erste Befunde [Effects of job subsidies under the participation opportunities act on participants' social participation: First findings]. *Sozialer Fortschritt*, 72(9–10), 709–730.
- Kluve, J. (2010). The effectiveness of European active labor market programs. *Labour Economics*, 17(6), 904–918.
- Korpi, T. (1997). Is utility related to employment status? Employment, unemployment, labor market policies and subjective well-being among Swedish youth. *Labour Economics*, 4(2), 125–147.
- Krug, G., & Eberl, A. (2018). What explains the negative effect of unemployment on health? An analysis accounting for reverse causality. *Research in Social Stratification and Mobility*, 55, 25–39.
- LaMontagne, A. D., Martin, A., Page, K. M., Reavley, N. J., Noblet, A. J., Milner, A. J., Keegel, T., & Smith, P. M. (2014). Workplace mental health: Developing an integrated intervention approach. *BMC Psychiatry*, 14(1), 131. <https://doi.org/10.1186/1471-244X-14-131>
- Lang, J., Janssen, S., Kruppe, T., Leber, U., & Zabel, C. (2022). Strukturwandel und berufliche Weiterbildung. [Structural change and professional development]. *IAB-Stellungnahme*, No. 09/2022. <https://doi.org/10.48720/IAB.SN.2209>
- Martin, J. P., & Grubb, D. (2001). What works for whom: A review of OECD countries' experiences with active labour market policies. *Swedish Economic Policy Review*, 8(2), 9–56.
- McFayden, R. G. (1995). Coping with threatened identities: Unemployed people's self-categorizations. *Current Psychology*, 14(3), 233–256.
- Minelli, L., Pigini, C., Chiavarini, M., & Bartolucci, F. (2014). Employment status and perceived health condition: Longitudinal data from Italy. *BMC Public Health*, 14(1), 946. <https://doi.org/10.1186/1471-2458-14-946>
- Modini, M., Joyce, S., Mykletun, A., Christensen, H., Bryant, R. A., Mitchell, P. B., & Harvey, S. B. (2016). The mental health benefits of employment: Results of a systematic meta-review. *Australasian Psychiatry*, 24(4), 331–336. <https://doi.org/10.1177/1039856215618523>
- Nicaise, I. (2007). Active labour market policies and social inclusion: The case of Flemish social enterprises. In J. Koning (Ed.), *The evaluation of active labour market policies: Measures, public private partnerships and benchmarking*. Edward Elgar Publishing.
- Paul, K. I., & Moser, K. (2009). Unemployment impairs mental health: Meta-analyses. *Journal of Vocational Behavior*, 74(3), 264–282. <https://doi.org/10.1016/j.jvb.2009.01.001>
- Peckham, T., Seixas, N., de Castro, A. B., & Hajat, A. (2022). Do different patterns of employment quality contribute to gender health inequities in the U.S.? A cross-sectional mediation analysis. *International Journal of Environmental Research and Public Health*, 19(18), 11237. doi:10.3390/ijerph191811237
- Peña-Casas, R., Ghailani, D., Spasova, S., & Vanhercke, B. (2019). In-work poverty in Europe: A study of national policies. <https://doi.org/10.2767/31835>
- Pohlen, L. (2019). Unemployment and social exclusion. *Journal of Economic Behavior & Organization*, 164, 273–299. <https://doi.org/10.1016/j.jebo.2019.06.006>
- Puig-Barrachina, V., Giró, P., Artazcoz, L., Bartoll, X., Cortés-Franch, I., Fernández, A., González-Marín, P., & Borrell, C. (2020). The impact of active labour market policies on health outcomes: A scoping review. *European Journal of Public Health*, 30(1), 36–42. <https://doi.org/10.1093/eurpub/ckz026>
- Roy, A. (1951). Some thoughts on the distribution of earnings. *Oxford Economic Papers*, 3(2), 135–145.
- Rubin, D. (1974). Estimating causal effects to treatments in randomised and nonrandomised studies. *Journal of Educational Psychology*, 66(5), 688–701.
- Rubin, D. (1980). Randomization analysis of experimental data: The fisher randomization test comment. *Journal of the American Statistical Association*, 75(371), 591–593.
- Sianesi, B. (2004). An evaluation of the Swedish system of active labour programmes in the 1990s. *The Review of Economics and Statistics*, 86(1), 133–155.
- Siegrist, J. (1996). *Soziale Krisen und Gesundheit: Eine Theorie der Gesundheitsförderung am Beispiel von Herz-Kreislauf-Risiken im Erwerbsleben [Social crises and health: A theory of health promotion using cardiovascular risk in working life as an example]*. Hogrefe-Verlag.
- Strandh, M. (2001). State intervention and mental well-being among the unemployed. *Journal of Social Policy*, 30(1), 57–80. <https://doi.org/10.1017/S0047279400006176>

- Tophoven, S., & Tisch, A. (2016). Dimensionen prekärer Beschäftigung und Gesundheit im mittleren Lebensalter [Dimensions of precarious employment and health in midlife]. *WSI-Mitteilungen*, 69(2), 105–112. <https://doi.org/10.5771/0342-300X-2016-2-105>
- Tübbicke, S. (2023). How sensitive are matching estimates of active labor market policy effects to typically unobserved confounders? *Journal for Labour Market Research*, 57(26), 1–16. <https://doi.org/10.1186/s12651-023-00352-9>
- Tübbicke, S., & Kasrin, Z. (2023). Teilhabechancengesetz: Die Maßnahme “Teilhabe am Arbeitsmarkt” erreicht ihre Zielgruppe am besten. [Participation Opportunities Act: The labour market programme “participation in the labour market” reaches its focus group best]. IAB-Forum, 15.03.2023 Nürnberg. <https://doi.org/10.48720/IAB.FOO.20230315.01>
- Wanger, S. (2020). Entwicklung von Erwerbstätigkeit, Arbeitszeit und Arbeitsvolumen nach Geschlecht: Ergebnisse der IAB-Arbeitszeitrechnung nach Alter und Geschlecht (AZR AG) für die Jahre 1991–2019 [Development of employment, working time and volume of work by gender: Results of the IAB Working Time Accounts by Age and Gender (AZR AG) for the years 1991–2019]. *IAB-Forschungsbericht*, No. 16/2020.
- Whelan, C. T., Layte, R., & Maître, B. (2003). Persistent income poverty and deprivation in the European Union: An analysis of the first three waves of the European Community household panel. *Journal of Social Policy*, 32(1), 1–18. <https://doi.org/10.1017/S0047279402006864>
- Whelan, C. T., Layte, R., Maître, B., & Nolan, B. (2001). Income, deprivation, and economic strain: An analysis of the European Community household panel. *European Sociological Review*, 17(4), 357–372. <https://doi.org/10.1093/esr/17.4.357>
- Winkelmann, L., & Winkelmann, R. (1998). Why are the unemployed so unhappy? Evidence from panel data. *Economica*, 65(257), 1–15.

How to cite this article: Bömmel, N., Coban, M., Kasrin, Z., Schiele, M., Wenzig, C., Wolff, J., & Zabel, C. (2025). From welfare to work: The health and material well-being effects of long-term employment subsidies in Germany. *International Journal of Social Welfare*, 34(1), e12653. <https://doi.org/10.1111/ijsw.12653>

APPENDIX A

TABLE A1 Survey questions underlying the indexes of material resources and health status.

Survey question	Scale
(a) Material resources for material participation	
Q1: Do you have car?	1 = Yes 2 = No, due to financial reasons 3 = No, due to other reasons
Q2: Do you have internet access, e.g., via smartphone, computer or tablet?	1 = Yes 2 = No, due to financial reasons 3 = No, due to other reasons
Q3: Do you buy new clothes from time to time, even if the old ones are not worn out yet?	1 = Yes 2 = No, due to financial reasons 3 = No, due to other reasons
(b) Material resources for participation in social activities	
Q1: Do you go on a holiday trip of at least 1 week per year?	1 = Yes 2 = No, due to financial reasons 3 = No, due to other reasons
Q2: Do you attend an event at least once a month, e.g., a sporting event, cinema, theatre or concert?	1 = Yes 2 = No, due to financial reasons 3 = No, due to other reasons
Q3: Do you pay for unexpected expenses with your own money, e.g., replacing a broken washing machine?	1 = Yes 2 = No, due to financial reasons 3 = No, due to other reasons
Q4: Do you save a fixed amount per month?	1 = Yes 2 = No, due to financial reasons 3 = No, due to other reasons
(c) Health status	
Q1: How would you generally describe your state of health in the last 4 weeks?	1 = Very good 2 = Good 3 = Satisfactory 4 = Less good 5 = Poor
Q2: How much have mental problems, such as anxiety, dejection or irritability, bothered you in the last 4 weeks?	1 = Not at all 2 = Little 3 = Moderately 4 = Quite 5 = Very
Q3: And how much energy did you have in the last 4 weeks?	1 = Very much 2 = Quite a lot 3 = Moderately much 4 = A little 5 = No energy at all

TABLE A2 Sample sizes and calliper used for radius matching.

	N (treated on support)	N (matched control)	Calliper
Full sample	1982	4212	0.0044
Men	1170	2536	0.0136
Women	811	1690	0.0167
Prior health impairments	880	2482	0.0194
No prior health impairments	1095	1788	0.0192
Age <50	947	2091	0.0331
Age ≥50	1029	2116	0.0086
≤25 h	464	3833	0.0100
>25–30 h	554	4312	0.0138
>30 h	964	4285	0.0080

Note: Radius calliper matching with 99th percentile of propensity score difference to first nearest neighbour as calliper, exact matching on cohort.

TABLE A3 Absolute outcome levels for weighted matched controls.

	Satisfaction with standard of living on a scale of 0–10	Material participation— percentage of maximum PCA score	Participation in social activities— percentage of maximum PCA score	Health satisfaction on a scale of 0–10	Health-based quality of life— percentage of maximum PCA score
Wave 1 (May 2020–March 2021)					
Full sample	5.77	79.66	58.59	5.77	54.25
Men	5.61	79.12	58.81	5.72	55.67
Women	5.97	79.76	56.85	5.81	50.83
Prior health impairments	5.43	78.96	54.41	4.80	47.45
No prior health impairments	6.04	79.98	60.60	6.53	59.22
Age <50	5.86	81.45	59.78	6.01	54.76
Age ≥50	5.58	77.41	56.73	5.49	52.18
≤25 h	5.77	78.72	56.40	5.65	51.59
>25–30 h	5.84	78.59	58.32	5.75	53.57
>30 h	5.73	80.03	58.68	5.89	55.23
Wave 2 (April 2021–March 2022)					
Full sample	5.80	79.86	62.04	5.70	52.25
Men	5.68	79.65	63.03	5.62	53.40
Women	6.03	80.38	60.16	5.77	49.04
Prior health impairments	5.42	79.85	58.58	4.89	45.69
No prior health impairments	6.08	79.08	63.36	6.35	57.30
Age <50	5.86	81.91	63.18	5.95	52.46
Age ≥50	5.65	76.55	58.70	5.42	50.07
≤25 h	5.70	79.57	59.83	5.61	49.57
>25–30 h	5.84	79.40	61.36	5.71	51.25
>30 h	5.81	79.60	61.46	5.76	53.60

Note: Radius calliper matching with 99th percentile of propensity score difference to first nearest neighbour as calliper, exact matching on cohort, weighted. See Table A2 for sample sizes and callipers.

TABLE A4 Variables used for the final matching step.^a

Variables from administrative data	Variables from survey data
Socio-demographic variables	
<ul style="list-style-type: none"> • Age • Gender • Eastern/western Germany • Programme cohort • Disability • Nationality 	<ul style="list-style-type: none"> • Education • Migration background • Type of serious health impairment diagnosed before 2019 <p><i>Family of origin variables</i></p> <ul style="list-style-type: none"> • Father's/ mother's level of education • Father/ mother employed when respondent was 15 years old • Whether lived with mother, father or both at age 15 • Number of siblings and age relative to siblings
Employment and benefit receipt history	
<ul style="list-style-type: none"> • Minijob in sampling month • Labour market programme participations in last 5 years/in last year <p><i>Characteristics of the last job:</i></p> <ul style="list-style-type: none"> • Sector • Earnings <p><i>Cumulated durations within the last 5 years:</i></p> <ul style="list-style-type: none"> • Contributory employment (continuous) • Minijobs (non-contributory) (continuous) • Unemployment insurance receipt (continuous) • Registered unemployment duration (categorised) <p><i>Cumulated durations within the last 7 years:</i></p> <ul style="list-style-type: none"> • Basic income support receipt (categorised) • Total employment (categorised) 	<ul style="list-style-type: none"> • Reason last job ended
Household variables	
<p><i>Characteristics at sampling time point</i></p> <ul style="list-style-type: none"> • Household type: single, lone parent, couple without children, couple with children • Number of children • Age of the youngest child • Adult children aged 18–24 in the household • Individual and household monthly net income without basic income support at sampling date 	<ul style="list-style-type: none"> • (Adult) children not in the household
Partner characteristics	
<ul style="list-style-type: none"> • Level of education • Citizenship • In contributory job at sampling time point • In minijob at sampling time point 	
Regional variables—values at sampling time point	
<ul style="list-style-type: none"> • Unemployment rate: average over last 12 months, at district level • Unemployment rate for age group ≥ 50 years: average over last 12 months, district level • Rate of unemployment with basic income support receipt, average over last 12 months, district level • Vacancy/unemployment ratio: average over last 12 months, district level • Regional labour market classification (Dauth, Dorner, & Blien, 2013) • Federal state • Jobcentre type: run in cooperation with employment agency or by municipalities alone 	

^aExact matching on cohort was used. Interactions with gender and region (eastern/western Germany) were specified for: age, education, migration background, continuous labour market history variables and household variables. Interactions with gender were specified for: partner variables and for the indicators on serious health impairments diagnosed before 2019.

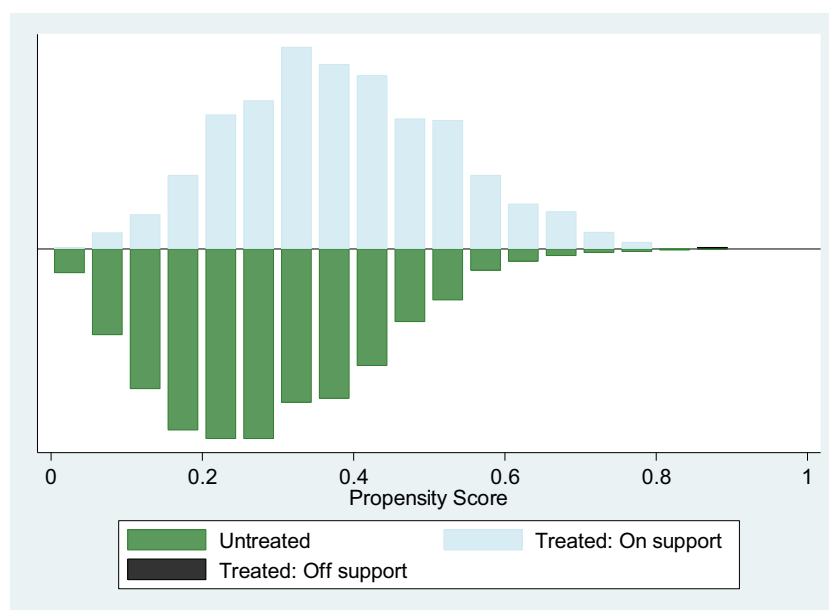


FIGURE A1 Common support plot for main sample for the final matching analysis. *N*: 2003 treated on support, 2 treated off support, 4321 controls.