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# Non-standard employment, low standard of living? The role of labour market and social policy measures in preventing material deprivation in different employment trajectories in Europe

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## Abstract

While the poverty risks of non-standard employment have been explored extensively, this study focuses on the role of activation-oriented social policy in alleviating material deprivation for persons with non-standard employment histories. Using EU-SILC data, individuals over a four-year period were analysed. I focused on substantial earners and distinguished between six non-standard employment histories expected to benefit from activation measures. Multi-level models revealed that compared to standard employment histories, all non-standard employment histories had higher material deprivation risks but to substantially different extents. At the macro level, participation in activation measures, expenditures in formal childcare and minimum income protection reduced material deprivation. Participation in training can be interpreted as an equaliser, as the deprivation gap between standard and most non-standard employment history types diminished. As expenditure- and participation-based measures differed significantly, evaluating the success of activation strategies in reducing inequalities and alleviating poverty highly depends on the measurement of activation.

## KEY WORDS

activation, atypical employment, employment history, European social policy, material deprivation, minimum income protection, non-standard employment, social investment

**Abbreviations:** ALMP, active labour market policies; AME, average marginal effect; EU-SILC, EU Statistics on Income and Living Conditions; GDP, gross domestic product; ICC, intraclass correlation coefficient; ISCED, International Standard Classification of Education; ISCO, International Standard Classification of Occupations; MIP, minimum income protection; NSE, non-standard employment; OECD, Organisation for economic co-operation and development; PES, public employment services; VET, vocational education and training.

## INTRODUCTION

In recent decades, increasing employment rates across Europe have been accompanied by an increasing share of non-standard employment (NSE) forms, such as part-time, fixed-term, temporary agency, marginal or self-employment. Rather than being limited to labour market

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entrants—for whom NSE frequently serves as a career stepping stone—or drop-outs (partial retirement), these NSE forms are also prevalent among individuals of prime working age for whom labour market embedding has taken place and the likelihood of social mobility has decreased (Horemans, 2018; Trinh, 2023). From a life course perspective, an individual continuously employed at a permanent full-time job has a standard employment history (Kalleberg, 2000). In addition to differing forms, NSE histories may also include transitions due to job changes or interruptions caused by unemployment, further training or inactivity due to care obligations. Furthermore, the financial importance of NSE for the household can differ significantly. Due to the gender-specific division of labour, the primary responsibility for securing the standard of living can depend less on one's own employment than on the employment of other household members. By excluding those who are primarily secured by their household rather than their employment, I focus on NSE histories of *substantial earners* whose labour income significantly contributes to the household income. Since a generalising analysis falls short regarding NSE histories, this study aims to elucidate disparities in living standards among substantial earners of prime working age with diverse NSE histories in Europe while examining the pivotal role played by labour market and social policy interventions in shaping these outcomes.

The income poverty risks of NSE have been studied extensively (de Graaf-Zijl & Nolan, 2011; Giesecke, 2009; Horemans, 2018; van Lancker, 2012; Westhoff, 2022). Part-time employment—predominantly carried out by women—and temporary employment are associated with increased income poverty risks. Although the household context can provide a reliable buffer for female part-time employment, through both short- and long-term analyses, gender-specific research has demonstrated the financial risks of long-term low labour force participation due to care work and its accompanying reconciliation problems (e.g., Möhring, 2021). Applying an employment course perspective, Halleröd et al. (2015) showed that, besides self-employed individuals, those with employment histories characterised by frequent periods of unemployment have the highest income poverty risks. They concluded that income poverty is an unemployment rather than a low-wage problem. This paper investigates whether this finding can also be applied to a low standard of living. In contrast to resource-based income poverty measurements, material deprivation measures poverty directly by defining a minimum standard of living as the possession of goods or access to activities perceived as necessary by most of society (Townsend, 1979, 1987). Deprivation occurs if people lack this minimum

standard of living due to financial constraints (Mack & Lansley, 1985). While income is a crucial determinant of living standards, significant differences exist between the two poverty indicators in many European countries (Whelan et al., 2004).

At the macro level, particularly until the 2008 financial crisis, employment conditions became more heterogeneous due to more flexible employment regulations, promoting job quality polarisation and labour market dualisation in many European countries (Brady & Biegert, 2017; Chung, 2019; Eichhorst & Marx, 2011; Palier & Thelen, 2010; Simoni & Vlandas, 2021). From 'protecting to activation' (Giddens, 2008), the *activation turn* quickly appeared in the European social policy agenda, aiming to empower people to participate in the labour market in the long term and be employable in a more flexible and deregulated working environment. While female employment rates have increased, and unemployment rates have decreased on average in Europe, a stable low-wage sector has also developed, and in-work poverty has increased (Lohmann & Marx, 2018). Using the keywords 'activation' and 'lifelong learning', emerging activation paradigms such as the social investment strategy (Hemerijck, 2018) focus on increasing NSE histories and aim to minimise and shorten financially risky phases due to unemployment, fewer working hours or interruptions due to care work (Bonoli, 2013). According to Hemerijck (2017), social investment must fulfil three functions: stock (lifelong learning) and flow (active labour market policies and activating family services), which are activation-oriented, and buffer (minimum income protection), which is protection-oriented. Considering these macro-level developments, I asked whether and to what extent states improve the living standard among people with NSE histories through these policies.

Regarding the impact of social policy measures, significant controversy surrounds the poverty-reducing effect of activation measures and social compensation policies on those with different employment histories (Cantillon, 2022). While some have argued that the welfare state's activation policy orientation allows the unemployed and inactive to reintegrate quickly into the labour market and thus reduces poverty risks, others have maintained that activation policy measures promote a Matthew effect, whereby success is mainly reserved for the privileged (Merton, 1968). This means activation measures primarily benefit those with a close labour market attachment. So far, most studies on the impact of activation policies have examined labour force participation or the poverty-reducing effect cross-sectionally or in a purely macro context (see, Bonoli, 2022 for an overview) with results supporting the poverty-reducing impact (Bakker & van Vliet, 2022; Benda et al., 2020;

Dewilde, 2008; Lohmann, 2009; Nelson, 2012) and the Matthew effect (Saltkjel & Malmberg-Heimonen, 2017; Visser et al., 2014). This paper aims to close this research gap, thus contributing to research on the opportunities and risks of European activation policies regarding NSE histories. Specifically, the paper analyses the role of labour market activation policies, work–family balance policies and minimum income protection policies on the living standards of those with non-standard and standard employment histories in Europe.

## THEORETICAL FRAMEWORK AND CONCEPTS

### Disadvantages of non-standard employment histories on the individual level

This section focuses on the relationship between employment histories and material deprivation at the micro level. Figure 1 outlines the study's multi-level framework. I argue that non-standardisation directly and indirectly affects the living standard (Path 1). First, people with NSE histories have lower wages due to interruptions, lower-quality employment or fewer hours, directly affecting their financial resources (Giesecke, 2009; Horemans et al., 2016). Second, non-standardisation may increase financial insecurity, complicating long-term economic planning and leading to a perception of being unable to afford specific goods (Visser et al., 2014). Third, lower labour market attachment leads to less pronounced employment-related social networks. Such social capital can be activated to prevent material deprivation by lending goods when needed (Israel, 2016). Therefore, *NSE employment histories should generally show higher material deprivation risks than standard employment histories (H1)*.

However, this study delves into this relationship in a more nuanced manner. I differentiate between types of NSE histories, assuming varying risks of material deprivation due to diverse reasons for and degrees of non-standardisation. The first type involves individuals who work part-time without interruptions, with the non-standardisation stemming from reduced working hours due to family caregiving responsibilities. The second type concerns those with employment interruptions, for example, due to the birth of a child or other acute family care needs. I classify these types as care-related NSE histories. This study also distinguishes between three additional types of employment-related NSE histories: individuals mainly employed based on fixed-term contracts, individuals with career interruptions

due to training and those with interruptions due to unemployment.<sup>1</sup>

*Care-related NSE histories:* Concerning care-related NSE histories, a gender-specific contextualisation is necessary. Even considering country-specific differences, care work in Europe is primarily performed by women; thus, employment interruptions and reductions due to care work are specific characteristics of female employment histories (Möhring, 2018; Stier & Lewin-Epstein, 2000). Particularly in a male breadwinner family model (Lewis, 2001), mothers may reduce their career expectations and focus on care work, leading to a weak long-term labour market attachment (Gangl & Zieffle, 2009). This can be seen, for example, in lengthy career breaks or continuous part-time employment with few working hours due to caregiving responsibilities. When reductions in working hours or interruptions are necessary to provide care, the economic security provided by other employed household members plays a vital role in alleviating deprivation (Horemans et al., 2016; van Lancker, 2012). Due to a gender-specific division of labour within couple households with children, care-related NSE often serves as an additional income source only and is less financially crucial for the household (Airio, 2008). I assume these employment histories veil the deprivation risks of similar care-related NSE histories among those who cannot rely on secure household buffers. Therefore, the following hypotheses focus on care-related NSE histories of *substantial earners* whose income is meaningful for the household.

Those who are permanently employed part-time due to care commitments have a higher risk of material deprivation primarily due to fewer working hours. Aside from care duties, a lower labour market attachment is also promoted as they tend to do the bulk of further unpaid household work in couple households (Solera & Mencarini, 2018; Stier & Lewin-Epstein, 2000). Additionally, they are more exposed to structural labour market inequalities, as part-time employment is more prevalent in sectors requiring fewer qualifications (Blau & Kahn, 2013; Brüll et al., 2019). Furthermore, female part-time workers are particularly susceptible to de-skilling risks (Garnero et al., 2014). However, part-time employed are not equally affected by these deprivation risks. While part-time employed with a high number of working hours show small differences in wage levels compared to full-time employed, there are high hourly wage gaps for part-time employed with a low number of hours (Paul, 2016). Therefore, this study distinguishes between care-related high-hours part-time employment

<sup>1</sup>Due to data restrictions, no further differentiation of NSE histories is possible. I address this limitation in the conclusion.

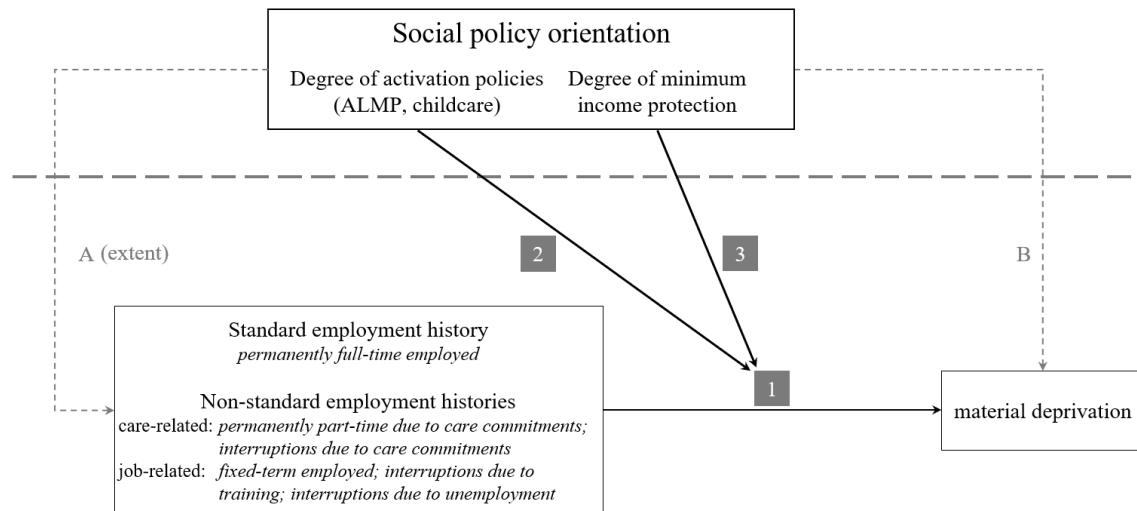


FIGURE 1 General theoretical framework.

with working hours close to full-time employment and care-related low-hours part-time employment. Particularly those with low working hours should be affected by higher deprivation risks (H1a).

The impact of care interruptions on material deprivation depends on their persistence and accumulation. Möhring (2021) showed that those with fewer and shorter interruptions had lower income poverty risks, particularly over the long term. Due to the financial importance of substantial earners labour income for the household, care-related interruptions should significantly affect substantial earners' living standards. Therefore, care-related deprivation risks should be more pronounced for those with care interruptions than for those with care-related part-time employment histories (H1b). Furthermore, due to the high share of women in care-related employment histories, women should be particularly affected by higher deprivation risks due to care duties (H1c).

*Employment-related NSE histories:* Regarding employment-related NSE histories, the higher material deprivation risks of NSE histories characterised mainly by temporary employment can be attributed to the indirect effect of lower labour market attachment and heightened employment insecurity due to the likelihood of unemployment between two jobs (Horemans, 2018). Additionally, lower job embeddedness is evident in the lower participation of temporarily employed individuals in on-the-job training (Adolfsson et al., 2022).

Employment interruptions due to further training during a period of inactivity or unemployment indicate that an individual's current skills are not in demand in the labour market, suggesting low labour market attachment. In addition to this indirect effect, these individuals earn no income during the training phase. However, the

goal of further training is stable integration into the labour market, which can reduce this adverse effect in the long term (Benda et al., 2020). Therefore, training is also an indicator of higher labour market attachment compared to people with unemployment interruptions, particularly concerning future employment opportunities. Thus, material deprivation risks should be less pronounced among those with training phases during employment interruptions compared to those with unemployment interruptions (H1d).

Finally, persons with NSE histories characterised by unemployment should have the highest risk of material deprivation, witnessing strong direct and indirect effects. Phases of unemployment increase the risk of material deprivation due to insufficient economic resources (Wolf et al., 2022). Persistent and frequent periods of unemployment indicate a weak and risky integration into the labour market. Furthermore, employment with such trajectories predominantly exists in the low-wage sector (Gangl, 2006; Graaf-Zijl & de Graaf-Zijl & Nolan, 2011). Thus, histories characterised by periods of unemployment should exhibit the highest risks of material deprivation among NSE histories (H1e). In the following, I show how and to what extent social policy measures moderate the material deprivation risks of NSE histories.

## Welfare state context and social investment paradigm

Social policy measures affect material deprivation risks in general (Figure 1, B) since they represent a financial safety net or provide monetary resources and opportunities to enhance one's living standard. While this effect is

controversial regarding activation measures, more consensus exists on the general poverty-reducing effect of income protection measures. Based on existing research and the social investment approach, I expected social policy measures to alleviate material deprivation, especially for the specific NSE histories discussed below (Figure 1, paths 2 and 3).

The social investment approach has roots in the debates on ‘new social risks’ (e.g., Esping-Andersen et al., 2002), characterised by interruptions and risky transitions due to employment-specific or care-related events (Bonoli, 2013). Hemerijck (2017) describes three functions of social investment. The *stock* function primarily refers to lifelong learning, through which obsolete skills (e.g., due to technological change) can be compensated for and renewed. Intended to prevent unemployment, this function can be seen as a preventive activation measure. The *flow* function describes securing and easing vulnerable transitions during employment. Active labour market policy services and activating family services are vital in securing and shortening these transitions. Finally, the *buffer* function enables employable people to actively look for a job matching their skills or undertake further training. This is achieved through generous short-term wage replacement benefits and adequate minimum income protection. Below, I explain how and to what extent activation (stock and flow) measures and income protection (buffer) measures affect the living standards of those with NSE histories.

*Activation measures:* According to Bonoli (2013), a clear definition of active social policy is impossible. Active social policy measures lie somewhere between measures that guarantee income and employment protection and measures that aim for recommodification through *workfare* instead of *welfare* (Dingeldey, 2007). Depending on their design, such measures can be protection and recommodification-oriented or more closely linked to one of these objectives. Conceptually, active policy measures can be divided into active labour market policies (ALMPs) and family policies, which facilitate employment for parents.

ALMPs ensure labour market participation by eliminating or reducing periods of inactivity and promoting skills relevant to the labour market. Bonoli (2010) outlined four main ALMP categories. *Incentive reinforcement* refers to the reduction or subsidisation of benefits through cash transfers. *Employment assistance* facilitates job searches through counselling and placement. *Occupation* denotes public sector employment or involvement in mainstream training programmes to keep the unemployed close to the labour market and employable. *Upskilling* refers to vocational training for people whose skills have become obsolete. Except for occupation, these

measures are primarily recommodification-oriented. However, in the long term, adequate counselling and training can also positively affect employment protection (Bakker & van Vliet, 2022). An activation strategy based on employment security aims to permanently integrate unemployed individuals into the labour market through further training and counselling, thus reducing future employment risks. According to the stock and flow functions, social investment-oriented activation aims to establish ‘soft’ (Haapanala, 2022) activation measures pursuing this objective. Therefore, labour market dualisation should be less pronounced in activation-oriented countries (Biegert, 2019). However, if ALMPs focus solely on fast (re)integration, these policies could lead to drawbacks due to strong perceptions of insecurity among those who remain unemployed or witness unstable labour market integration. Through employment assistance and upskilling, those mainly employed on a fixed-term basis should also benefit, as they can quickly bridge short periods of unemployment. Therefore, due to better labour market embeddedness in terms of shorter and less intense phases of unemployment and better skill matching, material deprivation risks should particularly decrease for those with training interruptions and fixed-term job contracts with higher levels of work-related activation measures in the sense of social investment-oriented activation (H2a).

Many consider subsidised childcare the most crucial activation policy measure for families as it allows for a quick and comprehensive return to the labour market for families who cannot afford childcare (Bakker & van Vliet, 2022; Bonoli, 2013). As mentioned above, labour market interruptions and marginal labour market attachment related to low-hours part-time employment increase material deprivation risks due to lower financial resources and de-skilling risks. Therefore, material deprivation risks should particularly decrease for those experiencing periods of inactivity due to domestic work and those with care-related part-time employment with higher levels of childcare subsidies fulfilling the flow function of social investment, leading to shorter interruptions and greater work intensity in terms of working hours (H2b).

*Minimum income protection (MIP):* The social investment paradigm considers solid MIP a necessary buffer, primarily during phases of unemployment (Hemerijck, 2017). However, opinions on the poverty-reducing effect vary, especially regarding the design (universal or targeted) and the long-term impact of income protection measures (for an overview, see Cantillon, 2022). Nevertheless, numerous studies have shown that income protection generally reduces material deprivation (Bárcena-Martín et al., 2014; Israel & Spannagel, 2019; Kenworthy et al., 2011;

Nelson, 2012; Saltkjel & Malmberg-Heimonen, 2017; Whelan & Maître, 2012).

Adequate MIP is a welfare state safety net designed to guarantee individuals a basic standard of living independent of labour market participation. The higher the welfare state income protection, the greater its de-commodifying effect. Besides the direct income effect, such policies directly affect employed persons with low-income employment, which arises via wage setting. As a wage replacement rate, MIP co-determines the minimum wage in the labour market (Visser et al., 2014). Better MIP has a more substantial effect on the wage level and, thus, on the material deprivation risk of employed persons benefiting from the wage increase. In addition to these direct effects, MIP indirectly affects material deprivation risk. A stable social safety net can give people facing employment risks and insecurity in their employment histories a sense of financial security through the de-commodification effect. A higher and longer-lasting sense of economic security positively affects living standards, thus reducing deprivation (Visser et al., 2014). This indirect effect mainly benefits those with NSE histories, such as those experiencing employment uncertainty due to fixed-term contracts.

As illustrated, people with NSE histories are likelier to be affected by low wages and experience insecure labour market integration. Since this buffer function is essential for persons with NSE histories, material deprivation risks of those with NSE histories should particularly decrease with higher levels of MIP as a solid safety net (H3a). Additionally, benefits should be higher for people who depend on them during periods of insufficient income from work or experiencing unemployment. Therefore, the decrease in the risk of material deprivation should be the highest for those with unemployment interruptions as they should gain the most from higher levels of MIP (H3b).

Moreover, activation and social protection measures affect the extent of NSE histories (Figure 1, A) since, for example, countries with high activation should have fewer unemployed individuals. Although this possible selection issue was not considered when deriving the hypotheses, I addressed it in the section robustness checks.

## DATA AND METHODS

### Sample

I used longitudinal data from the EU Statistics on Income and Living Conditions (EU-SILC) survey, conducted annually in 32 European countries (Atkinson et al., 2002).

I restricted the data to the two cohorts before the Covid-19 pandemic, in 2018 and 2019. Each survey year contains data for a four-year period for 25% of the sample. Data on 4 years of employment history provide a right- and left-censored snapshot of the main employment phase. As unemployment experiences or care interruptions before the observed period were unknown, I included relevant socio-demographic control variables (see below). Since the main employment phase is typically more stable than the entry and exit phases, a four-year period provides a reasonable basis for understanding this phase. Data on employment status are available on a monthly basis. I focused on individuals of prime working age; thus, I only included persons whose labour market entry was at least 5 years before the survey, and the maximum age was 55. Employment histories of individuals who could not enter the labour market due to domestic work or illness for more than 24 of the 48 months or who did not work for at least 12 out of the 48 months were excluded. Therefore, I focused on employable persons who could be affected by activation measures. To concentrate on individuals whose income significantly contributes to the household, I only considered persons whose average employment income over the 4 years amounted to at least one-third ( $>33\%$ ) of household income. I refer to these persons as *substantial earners* since their income can be considered significant to the household's financial situation. After case selection and data cleaning, the employment histories of 44,943 individuals over 48 months in 26 countries remained.

## Operationalisation

*Individual level:* The main explanatory variable was a person's employment history over 48 months. I built 10 employment history types based on seven activity statuses: employed full-time, employed part-time, unemployed, in training (vocational training, further study or training), fulfilling domestic tasks, inactive (e.g., early retirement, disabled or in military service) and self-employed. The reference category, a standard employment history, includes persons who had been employed permanently and predominantly (more than 24 months) in full-time. I distinguished nine types of NSE histories, six central to the analysis. First, I have categorised three types of care-related employment histories. Individuals living with children in a household working permanently and predominantly (more than 24 months) in low-hours part-time employment (less than 28 h) or high-hours part-time employment (equal or more than 28 h) comprised two trajectories with permanent lower labour

market participation due to care work.<sup>2</sup> In the following, these will be referred to as *low* and *high* part-time employment histories. The third type comprised persons who experienced employment interruptions mainly due to domestic work. Second, I distinguished between three employment-related NSE histories: persons who had a job (at least 36 months) based on a fixed-term contract in at least three of the 4 years, persons who experienced employment interruptions mainly due to unemployment (fewer than 24 months) and persons who witnessed employment interruptions due to training. With the exception of the latter, which included all individuals who had witnessed training interruptions, persons who had witnessed multiple types of interruption were placed in the category of the interruption of longest duration. Finally, three additional NSE histories were discussed only briefly in the analysis: persons who were mainly self-employed (more than 24 months), persons who were mainly unemployed (more than 24 months) and persons with other NSE histories. Although most individuals who were self-employed for fewer than 24 months belonged to the 'other' category, some were in the focused NSE histories; thus, I also did robustness checks excluding self-employed individuals. Since early retirement, disability, and military service represent particular interruptions to the main employment phase, people with these interruptions were in the 'other' category.

The dependent variable was whether a person experienced material deprivation after the observed employment period. For this purpose, I used the modified indicator of material deprivation described by Guio et al. (2016), which the European Commission also uses as a poverty indicator. The material deprivation index comprises 13 items: some new clothes, two pairs of shoes, some money for oneself, leisure activities, monthly drinks or meals, replacements for worn-out furniture, a meal with meat, chicken or fish (or vegetarian equivalents), the ability to face unexpected expenses, keeping the home adequately warm, a one-week annual holiday away from home, avoiding arrears, a computer or internet and a personal car. Material deprivation is measured dichotomously, occurring when individuals do not have five or more of these items because they cannot afford them.<sup>3</sup>

<sup>2</sup>Unlike the employment status, the hours worked are not available on a monthly basis, but yearly for the current employment situation.

Therefore, the mean value of working hours over the four-year period was used for the classification into low-hours and high-hours part-time.

<sup>3</sup>As the activity status refers to the year before the survey and material deprivation refers to the current situation, a time lag may exist between the end of the observed employment history and the measured deprivation risk. Nevertheless, I preferred the retrospective monthly employment status data over the yearly data, as the latter only provide a snapshot within the observed year.

The micro-level control variables were sex (female, male), age and marital status (unmarried, married, divorced/widowed) at the end of the observed period, education (based on the ISCED classification: low 0–200, medium 300–450, high 500–800), and number of children in the household over the four-year period (no children, at least one child in 1 year, two children at least in 1 year, more than two children). Due to missing data, it was not possible to control for job characteristics such as sector. The data include occupational status (ISCO-08, one digit), but data are missing in two countries for half of the sample (Germany and Slovenia for the 2019 cohort) and in one country (Slovakia) at the end of the observed period. Therefore, I performed robustness checks with a reduced sample in which I considered occupational status (nine categories).

*Country level:* I used expenditure-based and participation-based activation indicators (Eurostat database). The former measure the monetary resources spent per country on activation, while the latter measure the concrete outcomes of activation-oriented social policies. The expenditure-based indicators are spending on ALMP per unemployed individual and preschool childcare per child, both in purchasing power parities. Regarding expenditures for ALMPs, I followed Bonoli (2013), taking the sum of spending on public employment services, employment incentives, training and direct job creation as the most relevant expenditures for activation policies. I used the vocational education and training (VET) rate among individuals aged 25–49 and the share of children younger than 3 years old in formal childcare as participation-based indicators. Compared to participation in public employment services (PES), VET corresponds to a more comprehensive activation concept addressing stock and flow functions. Nevertheless, I also conducted analyses with participation in PES as robustness checks. From a social investment perspective, NSE histories should especially benefit countries with extensive activation. Therefore, I also created expenditure-based and participation-based activation indices as a robustness check.

I measured MIP based on the average level of adequate minimum income benefits over the observed period for each country (OECD database). This is defined as the income received by an unemployed single person without children, expressed as a percentage of the median disposable income of the respective country. Control variables at the macro-level were the average GDP per capita in purchasing power standards and the unemployed rate of the labour force population (Eurostat database) over the observed period. I used the four-year average for all macro variables and standardised all macro variables for comparability. Table A2 and A3 in

the Appendix provide further information about the sources as well as country-specific descriptives.

## Analytic strategy

I used regression analyses to examine the micro-, macro- and cross-level correlations. The focus was on the interaction effects of the employment history types with the activation variables and MIP. Due to the dichotomous dependent variable, material deprivation, I applied logistic multi-level random intercept models in which the two levels were individuals nested in countries (Rabe-Hesketh & Skrondal, 2022). Regarding activation measures, I estimated the following hierarchical two-level regression model for the probability of being materially deprived:

$$\begin{aligned} \text{logit} \left\{ \Pr \left( \text{material deprived}_{ij} = 1 | x_{ij}, \zeta_j \right) \right\} &= \text{logit}(\pi_{ij}) \\ &= \eta_{ij} = \gamma_{00} + \gamma_{10} \text{employment history}_{ij} + \gamma_{01} \text{activation}_{ij} \\ &\quad + \gamma_{11} \text{employment history}_{ij} * \text{activation}_{ij} \\ &\quad + \gamma_{10} \text{micro level controls}_{ij} + \gamma_{0j} \text{GDP}_j \\ &\quad + \gamma_{0j} \text{unempl. rate}_j + U_{0j} + R_{ij} \end{aligned} \quad (1)$$

where  $\gamma_{ij}$  describes the fixed effects, the error term  $U_{0j}$  contains the country-specific level-2 unobserved characteristics and is therefore constant across individuals, and the level-1 error term  $R_{ij}$  captures the individual unobserved characteristics and varies between individuals ( $i$ ) and between countries ( $j$ ). I assumed that  $U_{0j}$  is independent across countries and the considered covariates and that  $R_{ij}$  is independent across the country- and individual-level observations and covariates. In the results, I report average marginal effects, which are comparable across groups and models (Mood, 2010). Since multi-level models estimate variance components for the different levels, the explained variance due to country-specific differences can be determined with the help of the intraclass correlation coefficient.

$$\text{ICC} = \tau_0^2 / (\sigma^2 + \tau_0^2) \quad (2)$$

where  $\tau_0^2$  is the country-level variance and  $\sigma^2$  is the individual-level variance. According to the ICC, 25.1% of the variance could be explained at the macro-level, which suggests a multi-level framework as material deprivation varies substantially across European countries.

## RESULTS

### Descriptive findings

Figure 2 shows the country-specific share of substantial earners in standard employment histories and in the focused NSE histories. In total, 71.3% of the individuals with NSE histories were classified as substantial earners, revealing the financial relevance of these employment histories across Europe. There were clear differences between countries, with shares of substantial earners ranging from 59.7% (Austria) to 83.9% (Sweden). Regarding welfare state typology, the Scandinavian countries showed a similar pattern, all having high shares of substantial earners in standard and NSE histories. In some countries (Austria, Germany, Ireland), above-average shares of substantial earners in standard employment histories were accompanied by far below-average shares in NSE histories. Excluding these countries, there was a strong and significant positive correlation ( $r = 0.75$ ) between the shares of substantial earners in standard and NSE histories.

At the micro-level, the six NSE histories comprised 20.8% of all employment histories among substantial earners. Those with interruptions due to unemployment formed the largest group (7.8%), followed by those with mainly fixed-term contracts (4.8%). The share of those with employment histories affected by care responsibilities was lower (low part-time 1.6%, high part-time 2.4%, domestic interruptions 2.6%), as was the share of those with training interruptions (1.7%; see also Table A4). To highlight the relevance of focusing on substantial earners

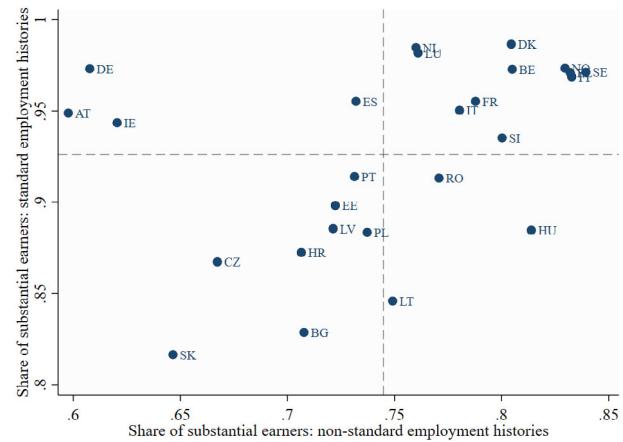


FIGURE 2 Share of substantial earners in standard and non-standard employment histories (mainly low/high part-time carers, care interruptions, mainly fixed-term contracts, training interruptions, unemployment interruptions). Grey dashed lines show the mean share at the country level. Longitudinal weights were used.

and the gender-specificity of specific NSE courses, Table 1 shows the shares of substantial earners and the material deprivation rates for substantial earners in comparison to additional earners, as well as the shares of women and the material deprivation rates of women and men. Substantial earners had significantly higher material deprivation risks than additional earners, and women witnessed significantly higher deprivation risks than men. The share of substantial earners was below average for all focused NSE histories. Moreover, besides those with unemployment interruptions, the share of women was above average.

Regarding care-related employment histories, those in low part-time employment witnessed the highest deprivation risks (12.6%), followed by those with domestic interruptions (7.0%) and those in high part-time employment (4.7%). Particularly for those with care-related part-time employment histories, the protective factor of additional household incomes became apparent since substantial earners witnessed significantly higher material deprivation risks. The share of substantial earners was lowest for those mainly in low part-time employment (42.5%), followed by those with care interruptions (59.5%). As expected, care-related part-time employment histories mostly belonged to females, with a share of 93.4% in low part-time and 83.2% in high part-time employment. Concerning material deprivation risks, no significant gender differences emerged among those with care-related part-time

employment histories. Nevertheless, due to the large share of women with these employment histories, material deprivation risks can be interpreted as gender specific. Among employment histories with care interruptions, women witnessed significantly higher material deprivation risks. Therefore, I estimated gender-specific models to check whether the micro-level results for these NSE histories differed substantially, which was not the case (see Figures A1 and A2 in the Appendix).

Compared to the sample average, low part-time carers were less likely to be highly educated (29.8% vs. 39.0%) and more likely to be divorced or widowed (21.8% vs. 10.5%). Those in high part-time employment and with care interruptions were more likely highly educated (46.9%; 48.1%), and high part-time carers were more likely divorced or widowed (15.7%). Those with care interruptions had the youngest household member at the end of the observation period (6.1 vs. 22.4 years), followed by those in high (10.8 years) and low part-time employment (11.1 years).

Regarding employment-related NSE, all three types had an above-average risk of material deprivation. Those with unemployment interruptions witnessed the highest material deprivation risks (18.6%), followed by those with mainly fixed-term contracts (11.9%) and those with training interruptions (10.8%). The protective household buffer was particularly relevant for those with unemployment interruptions; substantial earners in these employment histories witnessed significantly higher material

TABLE 1 Material deprivation risks (MDR) of employment history types for substantial and additional earner as well as for women and men.

	Additional earner (AE) vs. substantial earner (SE)				Gender-specific differences among SE			
	Share of SE	MDR (AE)	MDR (SE)	t-test	Share of women	MDR (women)	MDR (men)	t-test
Mainly full-time	94.0	4.1	5.7	**	36.9	6.8	5.1	***
Mainly low part-time carers	42.5	4.3	12.6	**	93.4	11.7	25.8	n.s.
Mainly high part-time carers	77.3	1.0	4.7	**	83.2	4.7	4.8	n.s.
Care interruptions	59.5	6.4	7.0	n.s.	66.4	8.7	3.5	**
Mainly fixed-term contracts	81.5	7.5	11.9	*	44.2	11.1	12.6	n.s.
Training interruptions	71.6	11.1	10.8	n.s.	53.1	13.6	7.5	n.s.
Unemployment interruptions	79.1	8.9	18.6	***	40.0	20.9	17.0	n.s.
Mainly self-employed	82.6	11.8	8.9	*	27.7	8.1	9.2	n.s.
Mainly unemployed	72.1	15.5	34.3	***	43.0	41.1	29.2	*
Other non-standard trajectories	75.6	7.2	12.1	**	56.0	12.4	11.8	n.s.
Total	84.9	7.1	8.6	**	41.3	9.7	7.8	***

Note: Number of observations: Substantial earner,  $n = 44,943$ ; Additional earner,  $n = 8056$ ; Women,  $n = 19,643$ ; Men,  $n = 25,300$ . Longitudinal weights applied.

\*Significance level:  $p < 0.05$ ; \*\*Significance level  $p < 0.01$ ; \*\*\*Significance level  $p < 0.001$ .

deprivation risks than additional earners. The share of women ranged between 40.0% (unemployment interruptions) and 53.1% (training interruptions), with no significant gender-specific differences in deprivation risks among the three work-related NSEs. Considering further sociodemographic characteristics, those with training interruptions differed significantly from the other employment histories. People with training interruptions were several years younger (34.9 vs. 42.9 years) and more likely to be highly educated (63.5%), unmarried (63.6%) and childless (65.5%). Persons with mainly fixed-term contracts and persons with unemployment interruptions had the highest share among those with a low educational level (for sociodemographic characteristics, see Table A1 in the Appendix).

## The individual level

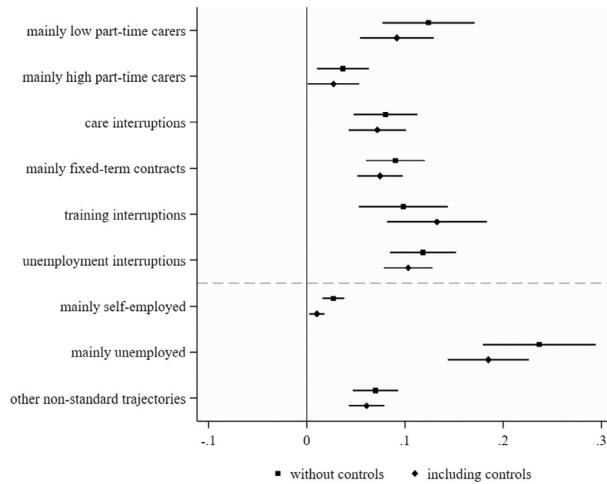
I tested the hypotheses at the micro-level first (H1, H1a–H1e), followed by the cross-level hypotheses on activation

(H2a, H2b) and MIP (H3a, H3b). Table 2 contains an overview of the hypotheses and the results. Figure 3 shows the average marginal effects of the different employment history types on the likelihood of material deprivation (Table A8 provides a tabular overview). The first model (squares) only integrated employment history type, and in the second (diamonds), the control variables at the micro and macro levels followed. Those with one of the six NSE history types had a significantly higher risk of deprivation than those in permanent full-time employment. Except for persons whose employment histories included training interruptions, the deprivation gaps became smaller by considering the control variables. However, all deprivation gaps remained significant, confirming H1.

Regarding care-related NSE histories, those in high part-time employment had the smallest deprivation gap (2.7 percentage points) and witnessed substantially lower risks of material deprivation than those in low part-time employment (9.2), which is in line with H1a. As expected, those in high part-time employment also witnessed significantly lower deprivation risks than persons

TABLE 2 Summary table of hypothesis testing.

<i>Hypotheses on the micro-level</i>		
H1	Individuals with NSE histories witness higher material deprivation risks compared to individuals with standard employment histories.	Confirmed
<i>Care-specific hypotheses</i>		
H1a	Individuals with care-related low-hours part-time employment histories witness higher material deprivation risks compared to individuals with care-related high-hours part-time employment histories.	Confirmed
H1b	Individuals with care-related interruptions witness higher material deprivation risks compared to individuals with care-related part-time employment histories.	Partially confirmed ( <i>for high part-time</i> )
H1c	Particularly female NSE histories are affected of care-related deprivation risks.	Confirmed
<i>Employment-specific hypotheses</i>		
H1d	Individuals with training interruptions witness lower risks of material deprivation compared to individuals with unemployment interruptions.	Partially confirmed ( <i>Matthew effect of taking up trainings</i> )
H1e	Individuals with unemployment interruptions exhibit the highest material deprivation risks.	Not confirmed ( <i>only for long-term unemployed</i> )
<i>Hypotheses on the cross-level: Activation measures</i>		
H2a	Individuals with NSE histories characterised by training interruptions or fixed-term contracts witness lower material deprivation gaps in countries with higher levels of employment-related activation measures.	Partially confirmed ( <i>only for participation</i> )
H2b	Individuals with care-related NSE histories witness lower material deprivation gaps in countries with higher levels care-related activation measures.	Partially confirmed ( <i>only low part-time for participation</i> )
<i>Hypotheses on the cross-level: Minimum income protection</i>		
H3a	Individuals with NSE histories witness lower material deprivation gaps in countries with higher levels of minimum income protection.	Not confirmed ( <i>see robustness checks</i> )
H3b	The material deprivation gap of individuals with unemployment interruptions should decrease the most with higher levels of minimum income protection.	Not confirmed



**FIGURE 3** Average marginal effects of employment history type on material deprivation. Shown are material deprivation gaps of NSE histories (reference category: mainly full-time). Coefficients displayed with 95% confidence intervals.

with care interruptions (7.2). However, the deprivation risks of low part-time employment did not differ substantially from those with care interruptions. Therefore, H1b could only be confirmed for those with care-related high part-time employment histories. Due to the gender share in the care-related employment histories, women are particularly affected by these higher deprivation risks, in line with H1c.

Regarding employment-related NSE histories, individuals with training interruptions had the highest deprivation gap (13.3), followed by those with unemployment interruptions (10.3) and those with mainly limited contracts (7.5). Considering the socio-demographic differences between those experiencing unemployment and those with training interruptions, their material deprivation risks did not significantly differ. Therefore, H1d, that those with training interruptions witness lower material deprivation risks than those with unemployment interruptions, could only be confirmed when not considering control variables, supporting the argument of a micro-level Matthew effect. Additionally, the deprivation gap of those with unemployment interruptions did not differ significantly from the gap of those in care-related low part-time employment. Thus, H1e, indicating that individuals with unemployment interruptions experience the highest risks of material deprivation, could only be confirmed for mainly (long-term) unemployed individuals (18.5).

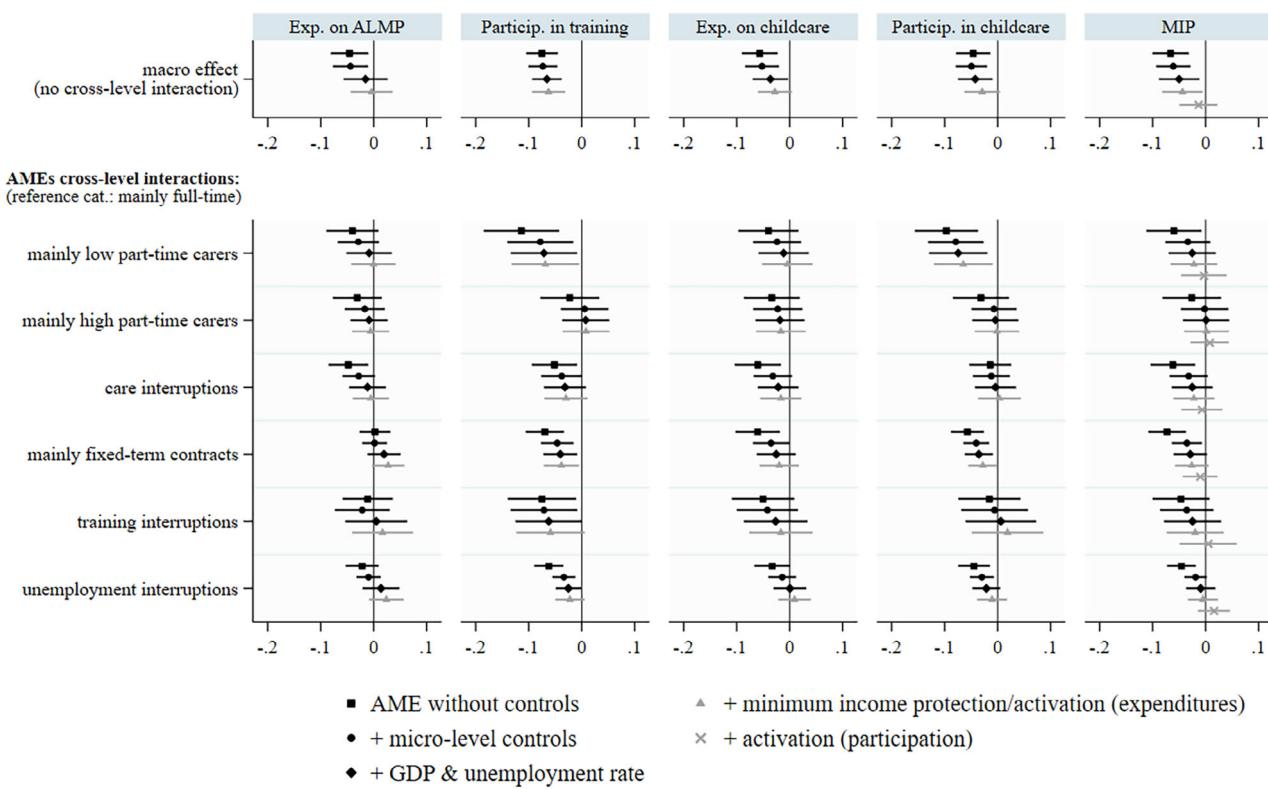
## Social policy orientation

First, I examined whether the material deprivation risks differed in terms of the level of activation measures and

MIP (macro effect). Figure 4 shows the AMEs for the activation variables for expenditures and participation rates and the level of MIP (see Table A9 for a tabular overview). The first three models included no controls (squares), micro-level controls (circles) and micro- and macro-level (GDP and unemployment rate) controls (diamonds). Next, in addition to GDP and unemployment rate, I added MIP and activation variables as macro-level controls (grey triangles and grey x). Since the sample was limited to 26 countries and significant correlations between GDP, MIP and the activation variables were found (see Appendix, Table A5), these effects should be interpreted cautiously due to possible macro-level multicollinearity. Therefore, I focus here on analysing the first three models.

Regarding the macro effect, the activation and MIP coefficients were significantly negative, indicating that substantial earners have a lower deprivation risk in countries with higher activation or MIP. However, when considering micro- and macro-level controls, the AME of ALMP expenditures became insignificant. Moreover, the AMEs also differed in terms of size. With a one standard deviation increase, the risk of deprivation was reduced by 6.6 percentage points based on participation in training, followed by MIP (5.0), childcare participation (4.2), childcare expenditures (3.6) and ALMP spending (1.5, not significant). While previous studies had ambivalent results, the results of this study showed that higher levels of participation in activation measures and MIP significantly reduced the general risk of material deprivation.

To examine whether the size of the deprivation gaps between permanent full-time employees and respondents with NSE histories differed with the level of activation measures and MIP, cross-level interaction effects were estimated. Figure 4 shows the AMEs of these interactions. Negative values indicate that individuals with NSE histories benefitted more from the measures than those with standard employment histories, showing that the deprivation gap narrowed. Regarding ALMP spending, only those with care interruptions gained significantly more (-4.8 percentage points). However, when considering control variables, the AME became smaller (-1.2) and insignificant. Furthermore, the AMEs for those with mainly limited contracts (2.0) and those with training interruptions (0.5) were not significant and positive, which was not expected. Therefore, H2a, that persons with mainly limited contracts or training interruptions particularly benefit from employment-related activation measures, could not be confirmed for ALMP expenditures. This changed when looking at participation in training. Apart from those mainly in high part-time employment, the deprivation gap narrowed significantly for all NSE histories. Considering control variables, the



**FIGURE 4** Average marginal effects of macro variables and cross-level interactions with employment history types on material deprivation. Coefficients displayed with 95% confidence intervals.

AME remained significant for those in low part-time employment ( $-7.1$ ), those with mainly limited contracts ( $-4.0$ ) and those with unemployment interruptions ( $-2.5$ ). Although the effect size was high for those with training interruptions ( $-6.2$ ), the AME became slightly insignificant. Consequently, regarding training participation, H2a could only be confirmed for those mainly with limited contracts.

Regarding childcare expenditures, those with care interruptions ( $-6.0$ ) gained significantly more. However, as the AME became smaller ( $-2.2$ ) and insignificant when considering controls, H2b could not be confirmed for the expenditure-based indicator. When participation in early childcare was higher, the deprivation gap was significantly lower for those mainly in low part-time employment ( $-9.7$ ) and remained significant on a high level ( $-7.4$ ) when considering controls. Therefore, looking at participation in early childcare, H2b could only be confirmed for those in care-related low part-time employment. Besides, the AME of those with mainly limited contracts was also negative ( $-3.5$ ) and significant, indicating a deprivation gap reduction.

Regarding MIP, except for those with training interruptions and those mainly in high part-time employment, a significant gap reduction occurred for persons with NSE histories, which diminished for any NSE history

when considering controls. Therefore, H3a could not be confirmed. Based on this, H3b, which assumed that individuals with employment histories characterised by unemployment interruptions would benefit most from higher income protection, could also not be confirmed. Nevertheless, apart from those mainly in high part-time employment, the AMEs were negative ranging from  $0.9$  to  $2.9$  percentage points.

Looking at the AMEs only provides a snapshot. To examine the deprivation gaps of the macro indicators more closely in terms of effect sizes, I calculated the predicted probabilities at representative values. In Figure 5, the y-axis shows the risk of material deprivation, and the x-axis shows the standardised level of the activation variables. I also included participation in ALMP to highlight differences compared to participation in training. The graphs show the models that include both micro and macro control variables. The plots illustrate the different strengths of the moderating macro variable in a more differentiated way than in Figure 4. Comparing the activation variables shows that the deprivation gap reduction of participation in training was strongest for all employment history types, as all lines have larger slopes. Focusing on the expenditure-based variables, childcare expenditures were a more holistic equaliser than ALMP; in particular, those with temporary contracts and those

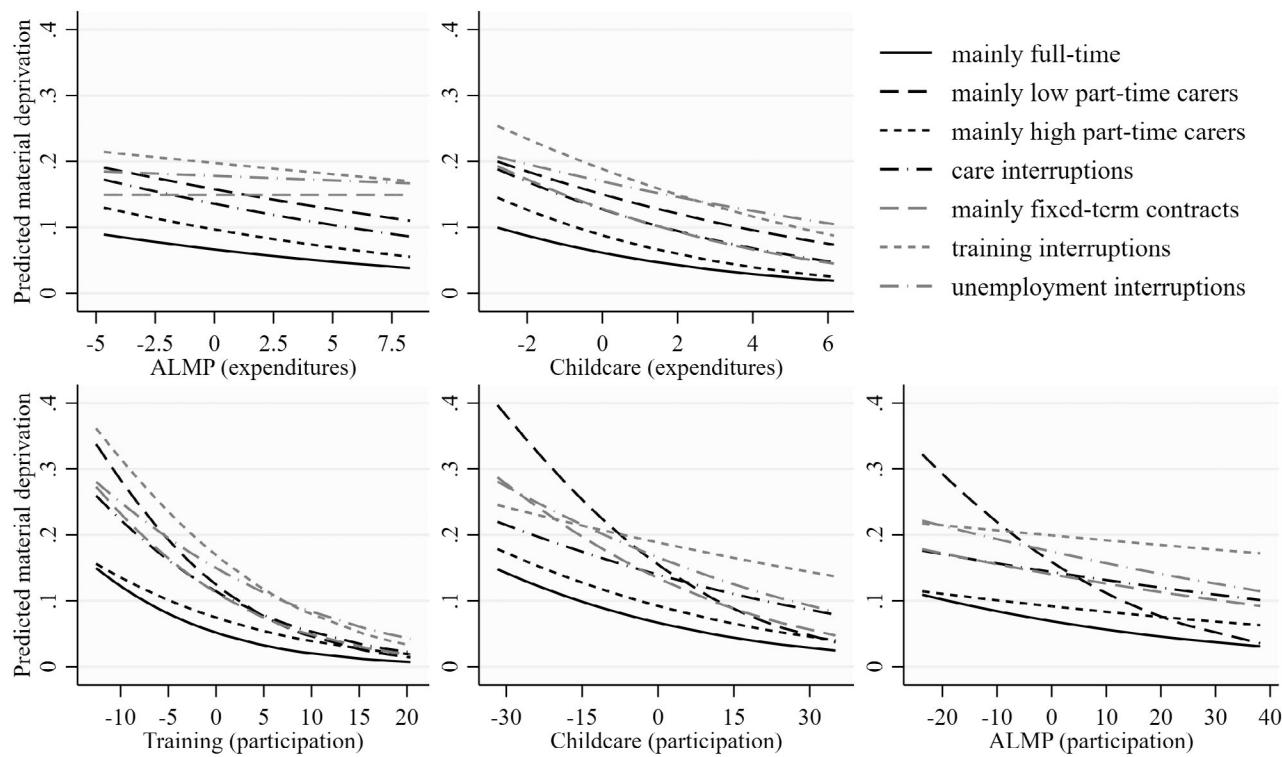


FIGURE 5 Predicted probabilities at representative values of the cross-level interaction between the macro variables and employment history types on material deprivation.

with unemployment interruptions hardly benefitted from higher levels of ALMP. Higher values of the rate-based activation variables were associated with an apparent reduction of the deprivation gap, especially for persons with low part-time employment histories due to care commitments. While childcare participation and participation in ALMP benefitted those with specific NSE histories, participation in training was a solid holistic equaliser regarding material deprivation risks.

### Robustness checks

I carried out further robustness checks, briefly described here and discussed in more detail in the Technical Appendix. To check whether the extent of NSE histories changed with the level of activation and MIP and, if so, whether they witnessed different degrees of labour market embeddedness, I estimated correlations between the average share of the employment history type in a country and the macro indicators (Table A6) and between the employment history types and variables indicating labour market embedding (Table A7). Regarding low part-time carers, the correlation between the prevalence of these employment histories in a country and the level of participation in childcare were significant. However, the correlation between the level of involvement in childcare and

average working hours in these employment histories within a country were not significant. Therefore, I did not assume better labour market embeddedness in terms of working hours to be responsible for the significant reduction of the deprivation gap. Furthermore, while people with training interruptions in their employment histories were more prevalent in countries with higher income protection, they were less embedded in the labour market in terms of working hours. One interpretation could be that a high, stable social safety net allows workers to focus more on training, and training durations can be longer and more comprehensive. Correlations between the macro indicators and the extent of employment histories with unemployment interruptions were not significant.

Second, I used activation indices instead of single indicators to check whether NSE histories particularly benefit workers in countries where activation is comprehensive (see Figure A3 in the Appendix). The results showed that only with the participation-based index did higher levels align with significantly lower risks of material deprivation. Additionally, higher levels of participation significantly reduced the deprivation gap between full-time employed and those care-related in low part-time employment, those with mainly fixed-term contracts and those with unemployment interruptions. The cross-level effects for the expenditure-based index were not significant.

Third, I set a stricter threshold of the minimum wage contribution to the household income to be included in the analysis (more than 50%). At the micro-level, the 50% threshold showed a higher deprivation gap for all focussed NSE histories; the increase was strongest for those in low and high part-time employment with care commitments. Regarding the cross-level results, there were hardly any differences in effect sizes between the subgroups. However, the deprivation gap for persons with training interruptions was significantly lower when participation in training was higher. Therefore, H2a could be confirmed among primary earners for the participation-based indicator (see Figures A4 and A5 in the Appendix).

Fourth, I also did checks including occupational status as a control variable. While there were no substantial micro-level differences, those with mainly fixed-term contracts benefitted to a slightly lesser extent from higher levels of training participation, and the AME remained significant only at the 90% significance level. However, I assumed that the insignificance was due to the smaller sample and, therefore, did not support rejecting H2a (see Figures A4 and A6 in the Appendix).

Finally, I estimated the models without people with phases of self-employment in their employment histories. As a result, higher MIP reduced the deprivation gap for those with low part-time employment histories due to care commitments, those with care or unemployment interruptions and those with temporary contracts, supporting a partial confirmation of H3a (Figure A7 in the Appendix). Although this suggests that the reported models underestimated the equalising power of MIP for dependent employees, I did not restrict the sample to dependent employees, as the exclusion also entails selection due to the different prevalence of self-employment in European labour markets.

## DISCUSSION AND CONCLUSION

This study sheds light on the role of labour market activation, work-family balance and minimum income protection on the material deprivation risks of different NSE histories across Europe. The results show that material deprivation risks are larger when earnings contribute substantially to the household income in most of the six NSE histories, especially for the two care-related part-time trajectories. In line with previous research (Giesecke, 2009; Halleröd et al., 2015), people with any NSE history have higher material deprivation risks than those with standard employment histories. Those with unemployment and training interruptions and permanent low-hours part-time carers have particularly high

deprivation risks. Focussing on substantial earners reveals that the marginal labour market attachment of primarily female, low-hours part-time carers is also a poverty risk in the present, not only during old age (Möhring, 2021). Moreover, the results of this study suggest a Matthew effect (Pavolini & van Lancker, 2018): further education during the main employment phase is associated with high deprivation risks, explaining why those with better socio-economic positions primarily take this risk. Additionally, in contrast to Halleröd et al. (2015), self-employed persons have low poverty risks in terms of material deprivation, possibly due to income measurement problems (underestimation) among the self-employed, aligning with Pissarides and Weber (1989).

Regarding the question of whether social investment policy measures can mitigate employment risks of NSE histories and thereby reduce or prevent labour market dualisation, a differentiated answer is necessary. Except for ALMP expenditures, higher activation measures reduce material deprivation, which aligns with previous research (Bakker & van Vliet, 2022; Benda et al., 2020; Lohmann, 2009). However, only participation in activation measures can be interpreted as an equaliser among specific NSE history types: First, in countries with higher participation in formal childcare, the deprivation gap for those in care-related low part-time narrows. Consequently, gender-specific labour market inequalities in terms of material deprivation risks attributed to care-related low part-time employment are less pronounced in countries where external childcare is more common. Second, higher participation in training reduces the deprivation gap for those with mainly fixed-term contracts and those with unemployment interruptions. Third, while in countries where training participation is high, the deprivation risks for all employment histories are similar, high ALMP participation is related to less equal outcomes. The latter findings favour a more comprehensive view on labour market activation respecting lifelong learning (stock) and training for unemployed people (flow) to reduce labour market inequalities in terms of material deprivation risks. In the context of demographic change and the resulting increased demand for skilled workers as well as an ageing workforce, this is relevant not only for reducing inequalities and dualisation tendencies between employees but also from an employer's point of view (European Commission, 2023).

Furthermore, the findings on activation measures demonstrate that expenditure-based measures cannot be equated with participation-based measures, particularly regarding labour market policy measures. As participation-based indicators can be interpreted as a direct activation measure, future research should concentrate on these when evaluating activation policies. Although general data on

training participation rates are available, further macro data on training, for example on the success of training participation or the field of training, is necessary. Especially considering that most country comparison studies use expenditure-based data to gain a broader scope in terms of time or country ranges as well as more precise data in terms of type of measure.

Regarding MIP, higher levels reduce material deprivation, consistent with most previous studies (Bárcena-Martín et al., 2014; Israel & Spannagel, 2019; Nelson, 2012; Saltkjel & Malmberg-Heimonen, 2017). However, I did not expect any NSE history type to benefit more from MIP than standard employment histories, as MIP should provide a buffer, particularly for those with unstable and insecure employment histories. I assume the role of MIP could be underestimated due to the inclusion of persons with phases of self-employment, which is also supported by the results of further robustness checks.

However, this study has several limitations. First, the observed employment histories are limited to a four-year period. The data, therefore, provide a snapshot of individuals' main employment phase. From a life course perspective, however, the observed trajectory depends heavily on previous events, which is why causal statements about the effect of specific events (e.g., unemployment) within the observed trajectory on the material deprivation risk are not possible. Nor are causal statements possible about whether an increase or decrease in activation or social policy measures within a country influences the deprivation gaps of NSE histories. Examining this would require a longer period at the macro level. To exclude external shocks, such as the financial crisis and its aftermath, I decided against extending the period to before 2015. Instead, I used correlation analyses to examine whether selection effects exist concerning the level of activation and MIP and the extent of employment history types. Considering this, conclusions can be drawn about how deprivation risks affect individuals with different NSE histories to varying degrees depending on a country's activation and social policy orientation. However, future research should conduct a longer-term observation at the macro level to address causality.

As a further limitation, I assumed that part-time workers with children in the household work part-time because they have care commitments. Although this may be true for many, it cannot be taken for granted nor is it possible to make any statements about the extent of care work. However, distinguishing between low-hours and high-hours part-time work addresses the latter issue. Although EU-SILC is straightforward concerning employment history, income, and living standards, the data offer no more detailed information about care duties or the reasons for taking up part-time employment.

Therefore, conclusions about people with other part-time employment histories cannot be drawn. In particular, focussing on those who work part-time due to a lack of labour market alternatives would be promising for cross-level analyses. Nevertheless, I assume that the central target groups of welfare state activation policies are captured by the selected NSE histories.

Finally, the data ended in 2019, before the start of the coronavirus pandemic. Recent studies have shown that COVID-19 implied significantly higher employment and income risks for non-standard employees than standard employees and affected women more than men (Cook & Grimshaw, 2021; Gunn et al., 2022; Möhring et al., 2021; Reichelt et al., 2021). Against this backdrop, it cannot be assumed that the gap in living standards between standard and NSE histories has decreased.

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## CONFLICT OF INTEREST STATEMENT

There are no relevant financial or non-financial competing interests to report.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from Eurostat. Restrictions apply to the availability of these data, which were used under licence for this study. The Stata code to replicate the study results is publicly available: <https://doi.org/10.17605/OSF.IO/HDY45>.

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Additional supporting information can be found online in the Supporting Information section at the end of this article.

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